SUSTAINABILITY ANALYSIS OF HUMAN SETTLEMENTS IN SOUTH AFRICA

Prepared for the Department of Housing
By CSIR Building and Construction Technology

CSIR

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July 2002

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Project number: BP533
Report number: BOU/ C368

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Chapter 1: Introduction

1.1 Background to the project

When it came into power in 1994, the current Government faced two challenges in the development of human settlements: delivering at scale to reduce the housing backlog, and overcoming the spatial exclusion inherited from the apartheid era. Combined with these local pressures was the international commitment to sustainable development which emerged more strongly over time.

As much of our development takes place within human settlements, the process of creating and operating these settlements has a major role to play in sustainable development. Sustainable human settlements would provide the physical, spatial, technological, cultural, socio-economic and institutional framework to support this process. This would logically apply to all types of human settlements found in both urban and rural areas. For this reason, the creation of sustainable human settlements was particularly included in Agenda 21(and articulated in Chapter 7 of Agenda 21), which, along with many other contemporary statements, led to the formulation of the Habitat Agenda[1].

As the major agent responsible for the development of sustainable human settlements, the Department of Housing has succeeded admirably in delivering at scale. However, the focus on quantity meant that the Department had fewer resources available for considerations of sustainability and quality in the housing product that was delivered. Similar constraints also hampered other government departments in the delivery of supporting infrastructure such as roads, schools and clinics. For this reason the ultimate sustainability of South African human settlements remains in question.

In order to meet its international commitments under Agenda 21 and the Habitat Agenda, as well as local policy priorities (e.g. the Integrated Sustainable Rural Development Programme and Urban Renewal Programme), the Department of Housing needs to develop a Human Settlement Policy Framework to provide strategic guidance for the development of human settlement policy that will deliver sustainable human settlements.

To develop such a Policy Framework, the following is needed:

- An understanding (definition) of sustainability in human settlements as drawn from the international debate, and its relevance to and meaning in the South African context.
- An understanding of the main forces of change influencing the human settlement development sector and how these impact on the different types of human settlement found in South Africa.
- An analysis of the sustainability of the different types of existing settlements in South Africa.
- An evaluation of existing National Government programmes and policy, as well as local government initiatives, and the support they offer for the development of sustainable human settlements.

From this information the specific sustainability policy issues, problems and challenges, as well as key success factors and threats for the range of human settlements in South Africa can be identified. Possible conflicts and gaps in national policies and programmes can also be identified. This will then provide the basis for recommendations in terms of focus areas for future policy and programme development that will support the creation of sustainable human settlements.

Whilst recognising that the Department's focus is on meeting the needs of the poor and disadvantaged, the position is taken that an integrated picture of South African settlements is needed. This should be a picture that includes both rich and poor, and their social and economic interactions with each other and with the biophysical environment. To support this position, a sustainability analysis is seen as investigating:

- The impact of settlements on the biophysical and socio-economic environments.
- The impact of the biophysical environment on the creation and operation of human settlements.
- The impact of the socio-economic environment on settlements and their biophysical environment.
- The impact of the institutional framework on settlements.

Within this context the report's understanding of sustainable development is one of an integrative and holistic process of maintaining a dynamic balance between the conflicting

needs of creating a fair and equal society, achieving an equitable distribution of wealth and opportunity, and sustaining the biophysical environment's ability to support an acceptable quality of life for this and future generations.

1.2 Outline of the report

This report can be divided in four parts:

- The context of the problem (Chapters 2 and 3)
- The methodology used (Chapter 4)
- The analysis (Chapter 5)
- The policy pressures and responses (Chapter 6)
- The conclusions (Chapter 7)

Chapter 2 discusses the international sustainability debate, providing a historical overview of how the concept of sustainable development has evolved, clarifying some of the terminology, describing some of the tensions, and discussing the interpretations of what a sustainable human settlement is. Chapter 3 provides an introduction to the different settlement typologies found in South Africa.

Chapter 4 describes the basic DPSIR (Driver, Pressure, State, Impact, Response) methodology followed and the indicators used for describing the state of human settlements.

Chapter 5 describes the "state" or current sustainability of human settlements in South Africa. By looking at the current state of human settlements, it becomes possible to identify the main drivers and pressures that shape our settlements, as well as the impacts of both these pressures and the state they have caused. These "drivers" and "pressures" are described in more detail in Appendix B. Chapter 5 also describes the sustainability of the various settlement types, as identified from the case studies and the literature.

Chapter 6 discusses the institutional issues both in terms of how they exert pressure on settlements and as they try to respond to the current state of settlements.

Chapter 7 describes the final conclusions and provides recommendations for further policy and other action that government will have to take in order to create sustainable human settlements in South Africa.

1.3 The context for the study

South Africa provides a particular context to the study of human settlements, which adds to the complexity of sustainability analysis. Its history has left not only negative social and economic impacts, but also a particular spatial legacy. The great diversity in settlement types, cultures, biophysical environments, and socio-economic development levels creates further complexity to what is already a multidimensional problem. Taking into account all these different inputs into human settlement development, a study such as this can only be conducted from a "systemic" understanding (see section 1.3.3 A systemic approach).

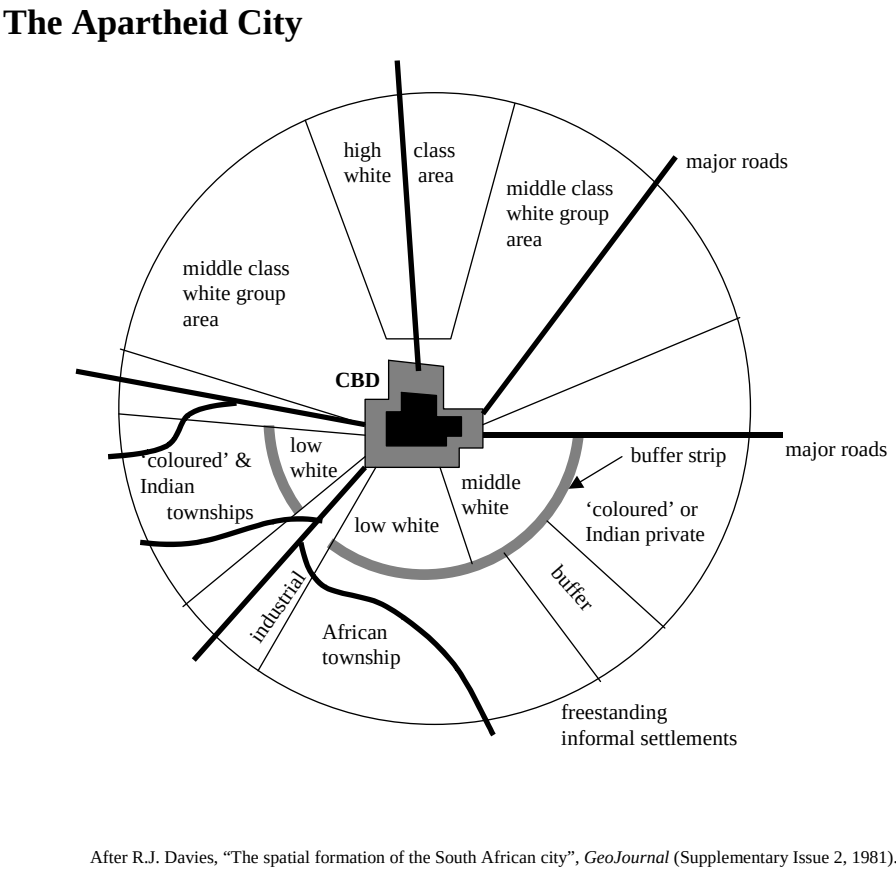
1.3.1 The South African settlement context

Human settlements cannot be considered in isolation; while their current state is time- and place-specific, it is also linked to what happened in earlier historical periods, and to people's projections of a possible future based on lessons or trends from the past. Therefore, one cannot reflect on the current state of human settlements without a basic understanding of the past and its impact on the urban future. South Africa has a very particular urban history and the twentieth century witnessed accelerated changes especially in the urban areas. Large-scale migration from rural areas, increasing urbanisation, separate development, extensive suburbanisation and peripheral growth, are but a few of the changes. However, at the heart of the biggest transformation lay the apartheid regime, with its aims of separate development and control, that ruled the country for some forty years. Urban segregation therefore takes on a very specific form in South Africa and apartheid provided a grand model for its implementation.

The introduction and institutionalisation of separate development (or apartheid) was not the beginning of geographic, institutional and social separation. Segregation was already a policy by the time apartheid was introduced at a national level in 1948. Since colonial times many different forces had shaped human settlements in South Africa increasingly along racial and class lines. This resulted in the exclusion of large sections of the population from the economic, social and environmental benefits of vibrant, integrated, sustainable urban development. These patterns established the foundation for grand apartheid that formally emerged in the second half of the twentieth century, in which was essentially a geographical attempt at partition, with dire spatial consequences.[2]

The results were wide ranging, leaving South Africa with cities that entrenched inequality, that were difficult to manage well, and that functioned poorly. In addition, it left distinctive spatial characteristics. At the city scale, Dewar[3] identifies three spatial characteristics that typified South African cities at the beginning of the nineties: low-density sprawl, fragmentation and separation. *Low-density sprawl* manifested in three processes that determined the pattern of growth. The first was speculative sprawl, which involved wealthier people seeking to privatise amenities and becoming the target group for developers, who target places of beauty to build their privatised "resorts" or "country estates". The second process, giving rise to low-density sprawl, was the development of low-cost housing schemes on the urban peripheries. A third process was illegal squatting by people who could not find a place in a designated housing area, or legal rights to reside in the cities and towns which lay within "white South Africa" and who sought a location closer to their places of work or other family members.

The second pattern is *fragmentation*. Cities reflected a cellular development pattern, since development occurred in relatively discrete pockets or cells, frequently bounded by freeways and/or buffers of open space. The result is a very coarse grain and fragmented urban pattern. As mentioned earlier, the primary reasons for this were the "neighbourhood unit" and "urban village" (garden city concept). An inevitable result of this cellular pattern is a simplified movement hierarchy. Isolated pockets of development are linked primarily by freeways and other limited-access forms of movement, which restricts opportunities in an urban structural sense. These "enclosed" cells emphasise the importance of a limited number of points only, and smaller businesses and public facilities are regularly excluded from these via the land market. At lower levels, the emphasis is almost entirely on local routes within the cells, supposedly to enhance a sense of community and community interaction.[4]



After R.J. Davies, "The spatial formation of the South African city", *GeoJournal* (Supplementary Issue 2, 1981).

Figure 1: The spatial formation of the South African city.
Source: M. Napier, CSIR.

The third pattern is *separation*. This included separation of land uses, races and income groups. The separation of places of work and residences was also deeply entrenched in the philosophy of urban management. The dominant urban land-use pattern resembled a series of relatively homogeneous "blobs" of different uses, connected by rapid transport routes. Increasing numbers of poorer people settled on the urban edges, leaving them further and further from urban opportunities.[5]

The cumulative impact of these characteristics was cities of inequity, resulting in "islands of spatial affluence" in a "sea of geographical misery".[6]

The current effects of this planning approach include displaced urban settlements[7] and a settlement pattern that is distorted, fragmented, unequal, incoherent and inefficient. It is a settlement pattern that generates enormous movement across vast areas, which is both time-consuming and costly, entrenching a system of unequal access to economic and social resources.[8] The result was spatial, social and economic exclusion of certain race groups to the benefit of others. It was also these, largely historically constructed, uneven forms of development that became the subject of transformation in the democratic South Africa of the 1990s.[9]

Despite the attempts at control of the location of people in settlements, during the 1970s many informal settlements developed on homeland borders close to cities, as townships became overcrowded and people moving to the city found no legal space in which to settle. Given the already peripheral location of the formal townships built by the State in the 1950s and 1960s, this meant that the poorest city residents were the most distant from urban opportunities such as economic and social amenities. A developed road network linked city centres to suburban areas and to other regions. Public bus and rail transport was heavily subsidised to transport people living on the periphery (and often in the rural hinterland) to their places of employment. Daily experiences of long travelling times and distances became the norm.[10]

The resultant urban sprawl and the continuation of illogical peri-urban/rural settlement patterns increased the need for personal mobility to access jobs, commercial services and social infrastructure. However, the low-density aspects of this sprawl meant that mass transport systems were inefficient and uncompetitive despite subsidies. This encouraged the use of private vehicles and taxis, which brought further problems such as pollution, an increase in road accidents, traffic congestion, and subsequently bigger roads and further sprawl.

1.3.2 A multidimensional problem

The sustainability of settlements is a multidimensional problem, dealing with spatial characteristics, geographical location, settlement dimensions, environmental conditions, economic viability, institutional ability and structure, human development, social relationships, and values and aspirations. South Africa presents a particularly complex scenario with nine provinces, 11 official languages, seven distinct biomes, 17 different types of municipalities, great religious and cultural diversity, and extremes of poverty and wealth, leading to extremes in human development levels. Existing standards of living and lack of awareness of the environmental impacts associated with them also lead to unrealistic expectations from people living in poverty and in relative wealth.

To this mix is added the dimension of time. Should a settlement be planned to be sustainable for twenty years or two thousand? With the number of world cities that are older than two millennia, the obvious answer would be at least two thousand. However, a study of those cities will show that they owe their long existence to continuous reinvention that allowed these cities to accommodate changes in the environment, society and economy, as well as new technological developments, all of which threatened the ability of those settlements to continue supporting an acceptable quality of human life. A degree of flexibility that allows for constant change is therefore necessary at all levels of planning, if sustainability is to be the outcome.

1.3.3 A systemic approach

The infinitely complex set of issues that determine sustainable development, and the realisation that these issues are interconnected and interdependent, identify sustainability as a systemic concept that requires a systems approach to problem solving and planning.

Systems thinking goes beyond events to looking for patterns of behaviour, and to seeking underlying systemic interrelationships

which are responsible for the patterns of behaviour and the events.[11]

A system is seen as an entity that maintains its existence through the mutual interaction of its parts. This definition of a system implies something beyond cause and effect. Rather than A simply affecting B, there is an implication that B also affects A. There are only two types of interaction. The one is a balancing feedback loop, which causes change in the opposite direction (if there is more of the one, there is less of the other). Balancing feedback loops negate change and stabilise systems. The other type is the reinforcing feedback loop, which causes change in the same direction (if there is more of the one, there is more of the other). These feedback loops are what drive change and growth.

The structure of complex systems, such as cities, is not a simple feedback loop where one system state dominates behaviour. The complex system has a multiplicity of feedback loops (see 1.3.2) with internal rates of flow that are controlled by non-linear relationships. Looking for linear cause-and-effect relationships that are closely related in time and space can be misleading and result in responses that only cause further problems. First, an attempt to relieve one set of symptoms may only create a new mode of system behaviour that also has unpleasant consequences. Second, the attempt to produce short-term improvement often sets the stage for long-term degradation.[12]

Associated with the idea of "system" is a principle called "emergence". From the mutual interaction of the parts of a system there arise characteristics which cannot be found as characteristics of any of the individual parts.[13] In the context of this study the emergent characteristic we would be looking for is sustainability. To understand the sustainability potential of a settlement, one has to study the system – that is, the interactions of all the multi-dimensional aspects of settlements described above. Studying the parts in isolation will not provide an appropriate understanding. Analysis (the breaking up of a system into its component parts, and then studying the parts) is therefore an imperfect tool with which to determine the sustainability of settlements.

1.4 Limitations and assumptions

In preparing this study, there were several limitations that determined the depth of the analysis and eventually forced certain assumptions.

As in most applied research, there were time and other resource constraints. Combined with the vast scope of factors impacting on settlement development, this meant that an in-depth investigation of the various drivers and pressures, as well as of the seven case study settlements, was not possible. Due to these constraints, it was also not possible to investigate policy development and programmes at provincial level.

As it was easier to access indicator data on a national scale than for each of the case studies, the resulting conclusions are very broad and generic, and may apply only selectively to the various settlement typologies found in South Africa. The seven case studies are also not fully representative of all settlement types and variations found in South Africa and, in the end, served to illustrate the complexity of the problem and the inappropriateness of blanket solutions, rather than provide a foundation for a settlement policy framework based on a settlement typology.

Accessing comparable data for the seven case study settlements was also difficult, with much of the data for smaller settlements not being captured at all. As the study took place before Integrated Development Plans were completed, it was difficult to get a sense of what the real issues and challenges were in each of the case study areas. The recent demarcation process has resulted in extensive restructuring within municipalities, making it difficult to always locate the relevant parties to interact with. New appointees where also not always *au fait* with the situation within their municipalities, as everyone was still coming to terms with the implications of the restructuring process. As a result of these limitations, secondary source material was used where direct evidence was not available or dependable.

The information available was not always reliable, consistent or comparable. There are discrepancies in the statistics and projections provided by Statistics SA, different government departments and external resources such as the World Bank and the United Nations. Of specific concern are population growth figures, urbanisation trends, HIV/AIDS infection rates and delivery of services. It was also difficult to determine the current access to services, as opposed to the services delivered. While the

official statistics may be based on delivered infrastructure, there is no accounting for infrastructure that had fallen into disrepair, or had otherwise collapsed. Some key issues have also not been adequately addressed because of a lack of sufficient information.

Two main sources of statistical data were used:

- The 1996 Census and the October Household Surveys between 1996 and 2000, obtained from Statistics SA; and
- The PIMMS-IDEA information system of the Department of Local and Provincial Government.

It was assumed that these provided a reasonable accurate picture, despite some discrepancies in the data.

It was further assumed that government at all levels was supportive of sustainable development and willing to implement changes towards greater sustainability. While this assumption did not impact on the way that data would be interpreted, it did make a difference to which factors were highlighted in the report, and the final conclusions and recommendations.

[1] The Habitat Agenda (Istanbul, August 1996) based its approach on many statements, including Agenda 21 (Brazil, 1992), "…the Fourth World Conference on Women (Beijing, 1995), World Summit for Social Development (Copenhagen, 1995), the International Conference on Population and Development (Cairo, 1994), the Global Conference on the Sustainable Development of Small Island Developing States (Barbados, 1994), the World Conference on Natural Disaster Reduction (Yokohama, 1994) and the World Conference on Human Rights (Vienna, 1993), as well as the World Summit for Children (New York, 1990) and the World Conference on Education for All (Jomtien, Thailand, 1990)" UNCHS (1996), "The Istanbul Declaration and the Habitat Agenda", from the Report Of The United Nations Conference On Human Settlements (Habitat Ii), Istanbul, 3-14 June 1996.

[2] White Paper on Spatial Planning and Land Use Management. (2001) Department of Agriculture and Land Affairs.

[3] Dewar, D. (1992) "Urbanization and the South African city: a manifesto for change" in D.M. Smith (ed.) *The Apartheid City and Beyond: Urbanisation and Social Change in South Africa*, London: Routledge.

[4] *Ibid*.

[5] *Ibid*.

[6] Williams, J.J. (2000) "South Africa: Urban Transformation" in *Cities*, Vol. 17, No. 3. pp. 167 – 183.

[7] Attempts were made to move economic opportunities to decentralised growth points in "homelands", often far from ports or other essential links, and so dense but dislocated settlements were built or grew informally around such artificial nodes. These are referred to as "displaced urban areas" and are a lasting element of the contemporary landscape. McCarthy, J and Bernstein, A. (1998) "South Africa's 'Discarded People: Survival Adaptation, and Current Challenges." CDE Research, Policy in the Making. Johannesburg: Centre for Development Enterprise.

[8] White Paper on Spatial Planning and Land Use Management, *op. cit*. p. 5.

[9] Williams, *op. cit*.

[10] CSIR (1999) *State of Human Settlements South Africa 1994-1998*. Pretoria: CSIR Publication BOU/CC276

[11] Belinger, G. (Undated) Systems: Understanding the Way. Accessed online 29/05/2002 http://www.outsights.com/systems/systems/systems.htm

[12] Forrester, J. (1969) *Urban Dynamics*. Portland: Productivity Press.

[13] *ibid.*

Chapter 2: The International Sustainability Debate

2.1 Introduction to the debate

The issue of sustainable human settlements lies within a broader international debate on sustainable development. This debate has been hampered by the perceived ambiguity, and even contradictory nature of the term. Its all-encompassing nature and inherent complexity has also made the concept vulnerable to large-scale co-option by agencies within the international development community and multinational business arena, agencies that very often use the term "sustainable development" for promoting activities that remain in essence based on an unsustainable development model.

This has given rise to considerable tensions between proponents of what has been described as weak sustainability and those demanding a stronger approach, as well as between the developed and the developing worlds. This chapter provides a brief introduction to these tensions and South Africa's position in the debate. As these tensions are partly due to an inaccurate understanding of the concept, its historical origins and its terminology, these aspects are also briefly discussed.

2.2 A concise history

During the latter half of the 20th century many nations began to realise that there was an environmental price to pay for human development. This price is on the one hand the depletion of non-renewable resources, such as the fossil fuels on which much of our current economic activity depends, and on the other hand the destruction of the environmental balance that creates the conditions supporting human life on the planet.

The great London fogs of the 1950's and crippling smog in large cities such as Los Angeles, Mexico City, Delhi and Istanbul; the poisoning of rivers and aquifers worldwide; the depletion of the ozone layer; deforestation and desertification around large cities in the developing world, with subsequent soil erosion and mudslides; and, in the 1990's, the final realisation that human activities are contributing to global climate change, all served to illustrate that development could not be sustained without attention to its effects on the biophysical support systems. This recognition of the interdependence of ecosystemic health and human well-being gave rise to what became known as the Green Agenda.

At the same time, transformations in thinking about socio-economic issues was demanding that we distribute the benefits acquired from using our natural resources in a more equitable manner between human beings and nations. The developmental debate was also being influenced by an increasing awareness of human rights (especially the rights of vulnerable groups such as women, children, the elderly, the disabled, and indigenous peoples), and the need for global peace.

Combined, these movements gave rise to the current view of sustainable development described by Ed Barbier[1] in 1986, of maximising goal achievement across the three systems identified as basic to development – namely the biophysical support system, the economic system and the social system. This understanding provided the foundation for the concept of sustainable development described by the World Commission on Environment and Development (WCED) in its report, *Our Common Future*[2], and the subsequent international manifestos on sustainable development, the *Agenda 21*[3] and *the Habitat Agenda*[4].

The WCED gave us the first, and still most popular, definition of sustainable development. It also introduced a line of reasoning for why we might need a shared concept of sustainable development: we need to ensure the continuation of the species, hence the emphasis on future generations.

> *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*
> *WCED, Our Common Future, 1987*

This definition has given rise to much debate about the nature of needs, whether we can accurately predict what the needs of future generations will be, and whether we should leave them natural capital or technological capital with which to meet their needs (see "weak" and "strong" sustainability). This split the camp into those who believe we should use what we can to eradicate poverty now (because, if given a proper education and economic power those future generations

would somehow find other solutions and other sources of wealth) and the camp that sees the Earth's resources as an irreplaceable endowment, with current generations entitled only to the interest, not to the capital.

Some guidance is given further in the report where the WCED clearly states that sustainable development would *"require the promotion of values that encourage consumption standards that are within the bounds of the **ecologically** possible and to which **all** could reasonably aspire"* (emphasis added). The report also called for a change in the current economic model. These recommendations are often conveniently left out of the mainstream international debate, but form the crux of what the protestors at the Davos and Genoa meetings of the World Trade Organisation and International Monetary Fund were demanding.

2.2.1 A sustainable development timeline

According to Holmberg[5] the impulse to couple "sustainability" with "development" can be traced to Barbara Ward, a founder of the Institute for Environment and Development (IIED) who first used it in the mid-1970s to make the point that environmental protection and development are linked. While the term *sustainable development* was first promoted by the World Conservation Strategy[6], there are several key events that contributed to the development of the concept. Table 1 provides an overview of these events.

1972	United Nations (UN) Conference on the Human Environment (Stockholm)	Led to the establishment of the United Nations Environment Programme (UNEP)
1972	The Club of Rome published the *Limits to Growth*	Prediction that if present growth trends continue, the environmental limits to growth will be reached within 100 years.
1974	UNEP and the United Nations Conference on Trade and Development held a seminar on Patterns of Resource Use, Environment and Development Strategies.	International debate on the relationship between economic growth and the natural resource base.
1980	International Union for the Conservation of Nature (IUCN), World Wildlife Fund (WWF) and the UN Environment Programme (UNEP) produced the World Conservation Strategy.	First global attempt to link environment and development. The phrase "sustainable development" is brought into the international debate.
1987	WCED (Brundtland Commission) produced the report entitled *Our Common Future*.	A widespread and politically acceptable definition of sustainable development is produced.
1992	UN Conference on Environment and Development – Rio Earth Summit	Production of the Rio Declaration, Agenda 21 and framework conventions on desertification, biodiversity and climate change.
1993	World Conference on Human Rights	Promotion and protection of human rights.
1994	Conference on Population and Development	The programme of action developed relates to, *inter alia*, population growth, gender equity, migration and education.
1995	World Summit for Social Development	Commitment to the goals of eradicating poverty, social integration, equality, access to education and accelerating the social, economic and resource development of Africa.
1995	World Conference on Women	Beijing Declaration outlining women's rights to sustainable development
1996	Un Conference on Human Settlements (Habitat II)	Production of the Habitat Agenda. Two major themes highlighted: adequate shelter for all and sustainable human settlement development.
1997	Earth Summit +5	Special session of the UN General Assembly to review and appraise the implementation of Agenda 21.
2001	Habitat +5	Special session of the UN General Assembly to review the implementation of the Habitat Agenda
2002	World Summit on Sustainable Development	The ten-year review of Agenda 21; the Summit will have a strong poverty focus.

Table 1: Key events in the development of the concept of sustainable development
Source. DEAT and CSIR[7]

2.2.2 A call to action

The main international policy document regarding sustainable development is Agenda 21. Agenda 21 is seen as an internationally accepted statement on, or benchmark for, achieving sustainable development in the 21st century. It represents a global consensus on the integration of environmental and development issues and suggests that sustainable development can be achieved only through the co-operation of all major groups (all levels of government, business, education and communities) and a holistic and integrated approach to problem-solving and decision-making. As Agenda 21 promotes the principle of "think global, act local", a bottom-up approach to sustainable development is advocated, paving the way for the concept of developmental local government as key to sustainable development, thus giving local authorities the mandate to develop sustainable development strategies or a local Agenda 21.

2.3 Confusing terminology

The terms "sustainability" and "sustainable development" are the biggest sources of confusion. They are often seen as describing two different ideologies, with sustainability seen either as pure economic viability, or as an environmental concept advocating the maintenance and repair of current environmental conditions and, in the extreme, a return to some kind of "noble savage" state. Sustainable development is seen as the more progressive approach advocating the goal of sustaining current development (often interpreted as economic growth and improved standards of living). These interpretations are misleading in the extreme. However, if we look at the historical background to the debate, the terminology becomes clearer.

2.3.1 Sustainability

"Sustain: to support, to keep alive, to keep going"

What we want to sustain is the species *homo sapiens.* The Rio Declaration, which forms the preamble to Agenda 21, states very clearly that:

> "*Human beings are at the centre of concern for sustainable development*."

Humans are therefore the main focus of the sustainable development debate and, rather unfortunately for them, all other species are valued only because of their ability to maintain the biosphere in a condition that supports human life and adds quality to it. Species extinction is a fact of planetary life and most species will eventually become extinct with or without human help, only to be replaced with others. Our concern is to keep planetary conditions favourable for human life at a global as well as local level. As even scientists do not fully understand the complex interrelationships between the different components of the biosphere, a prudent approach is advocated, hence the call for biodiversity conservation and environmental protection.

Sustainability is therefore the condition or state that would allow the continued existence of *homo sapiens*, and it is the goal we would like to achieve. Because of endlessly changing external and internal (societal) conditions, this is not a fixed state, but one of dynamic balance where we will have to continuously adapt to these changing conditions.

In order to achieve this state, we will have to meet certain requirements. Firstly we need to balance the needs of humans with the carrying capacity of the planet, and with the need to protect that capacity so that the needs of future generations can continue to be met.

However, mere survival is not our goal. We want to be able to live in an environment that provides a certain quality of life – that meets our full hierarchy of needs. The most basic requirement for this is the ability of all to live a safe, healthy and productive life in harmony with nature and local cultural and spiritual values.[8]

To get this, we need to achieve a measure of social and economic equity between individuals, as well as between communities, nations and generations. We have to find a way to equitably distribute wealth (in the form of access to resources and opportunities) and increase prosperity for all although some commentators might challenge the likelihood of this happening or being allowed to happen by more powerful nations and interest groups.

This line of reasoning led commentators to the three pillars of sustainable development – people, planet and prosperity.

2.3.2 Sustainable development

Contrary to popular belief, sustainable development is not merely development that can be sustained, but rather the kind of development we need to pursue in order to achieve the state of sustainability. It is not the

goal, but the process of maintaining a dynamic balance between the demands of people and what is ecologically possible. Development is also not just seen in its narrow meaning of growth, expansion and acquiring knowledge, but as progress through improvement, evolution and the quest for wisdom.

2.3.3 The principles of sustainable development

While the scope of the term is still evolving as it is co-opted by more and more disciplines and advocacy groups, it is generally agreed to place certain demands on human activity in the three systems central to development. These are stated as ideals to which nations are called to aspire. As will be shown in the following section, there are many tensions that arise from the statement of these ideals and the way in which they are likely to be interpreted and implemented by more and less powerful nations and interest groups. Nevertheless, as they are put forwards as goals which require a balanced and equitable approach.

The economic aspects of sustainable development require the development of an economic system that facilitates equitable access to resources and opportunities and the fair sharing of finite ecologically productive space that enables sustainable livelihoods and establishes viable businesses and industries based on sound ethical principles. The focus is on attempting to create prosperity for all, not just profits for a few, and to do this within the bounds of the ecologically possible and without infringing on basic human rights.

The social aspects of sustainable development require that we enable the development of fair and just societies that foster positive human development and provide people with opportunities for self-actualisation and an acceptable quality of life.

The environmental aspects of sustainable development require that we find a balance between protecting the physical environment and its resources, and using these resources in a way that will allow the earth to continue supporting an acceptable quality of life for human beings.

It is highly unlikely that all of the sustainability principles implicit in the above statements can be upheld at all times, as they have conflicting requirements. Most of the time, decision-makers will have to make trade-offs and otherwise try to balance the different requirements to find a solution that is the optimum one for the greater good. These decisions need to be flexible and should be regularly reviewed against agreed-upon indicators, to keep the three systems in dynamic balance and ensure that one sphere is not developed at the expense of the others.

2.4 Tensions within the debate

As said earlier, there are many tensions within the debate on how to achieve sustainable development. They are mainly between the concerns of the North (developed world) and those of the South (what is called the underdeveloped or developing world). These tensions pose particular difficulties for South Africa with the extremes of wealth and poverty represented within one country.

This poses the question of who should be responsible for formulating the sustainable development model. Should it be the North, which was responsible for creating most of the problems that sustainable development attempts to address and has a vested interest in trying to maintain current unequal economic models and global power balances, or should it be the South, which traditionally has a more value-orientated, community-based notion of development (although this is rapidly eroding)?

As initially mentioned in Chapter 1, another set of tensions arises from the time frame within which responses are planned. If we are dealing with the survival of the human species, can we afford to make decisions that will threaten that survival fifty or four hundred years in the future? Or do we limit our decisions to a time frame of twenty or thirty years and hope that technology will develop to mitigate the consequences of our actions at a later stage?

2.4.1 The ”Brown” and ”Green” agendas

The Green Agenda concentrates on reducing the impact of urban-based production, consumption and waste generation on natural resources and ecosystems and ultimately on the world’s life-support systems. In general the Green Agenda is more pressing in affluent cities or parts of the city. The Brown Agenda emphasises the need to reduce the environmental threats to health that arise from poor sanitary conditions, crowding, inadequate water provision, hazardous air and water pollution, and local accumulations of solid

waste. The Brown Agenda is therefore more pertinent in poor, under-serviced cities or parts of cities.[9]

South Africa is in a particularly difficult position as the interaction between the Brown and Green Agendas is further complicated by the need to address past inequities in service delivery in a manner that is socially acceptable to both rich and poor, which will enable us to live within what is ecologically possible, given our small resource base, and which minimises the negative environmental impacts associated with both Green and Brown agendas.

Table 2 illustrates the main differences between the brown and green agendas.

	Brown	Green
Key concern	Human well-being	Ecosystemic well-being
Timeframe	Immediate	Delayed
Scale	Local	Local to global
Concerned about	Low-income groups	Future generations
View of Nature	Manipulate and use	Protect and work with
Environmental services	Provide more	Use less

Table 2: Difference between the Brown and Green Agendas[10]

2.4.2 Weak versus strong sustainability

Depending on the willingness of stakeholders to accept and participate in change, efforts towards sustainability can be placed on a continuum between weak (false) and strong (true) sustainability, the key criterion being whether current development and consumption patterns will allow future generations to meet their basic needs.

Key to this intergenerational equity aspect of sustainable development is the question of how much we can use now and how much we should leave for future generations. To enable us to measure our resource wealth three kinds of capital have been identified by Turner and Pierce[11]:

- *Natural capital*: natural resources and the services provided to humans by the biophysical environment.
- *Social capital*: education/skills, health, and connectedness to people and community.
- *Manufactured/financial capital*: buildings, infrastructure, goods, information resources, credit and debt.

Weak sustainability is the idea that different kinds of capital are fully interchangeable and that natural capital can therefore be used up as long as it is converted into manufactured capital of equal value. If this rule is applied it would, for instance, be justified to run down the environment, provided the proceeds of environmental degradation were reinvested in other forms of capital.

Strong sustainability is the idea that there are certain functions that the environment performs that are essential for the welfare and survival of the human species and which cannot be duplicated by humans. These ecological assets are called "critical natural capital" and cannot be traded for any of the other forms of capital, as their depletion would endanger human survival. Examples are the ozone layer, the carbon cycle and the hydrological cycle.

Thus, while it may seem perfectly rational to trade natural capital of a given value for human-made capital of equal or greater value within a static framework, this is not true within a dynamic framework – that is, modelling economic systems through time. This is so firstly because we would be living off our irreplaceable and non-substitutable natural capital, instead of off the revenue derived from that capital and, secondly, because the human-made capital with which we replace it will eventually depreciate in value, leaving us with nothing. Over the long term the sustainability of *homo sapiens* will therefore be threatened by the "weak" sustainability approach.

"*Only when the last tree has died and the last river been poisoned and the last fish been caught will we realise that we cannot eat money.*"
19th Century Cree Indian Prophecy

2.4.3. Another form of imperialism?

The models of sustainable development described so far have contained a number of assumptions which need to be challenged or at least thought through. The model of social and economic equity which underpins Agenda 21 is mainly based on the Western liberal democratic value system shaped by the previous millennium's social revolutions in Europe. Increasing scepticism from the developing world, detailed below, suggests that sustainable development as promoted and practised by the international

development agencies is simply "business as usual", and that, despite its lip service to "harmony with local cultural and spiritual values" it often conflicts with the values held by the non-industrialised countries, or at best does not acknowledge the validity of other value systems. There is also scepticism about the ability of the West to provide the real solutions to problems that were essentially created by its development model.

During a plenary discussion forum at the recent Global Urban 21 Conference in Berlin (4-6 July 2000) Kirtee Shah, President of *Habitat International Coalition,* pointed out that it is unlikely that sustainable human settlement will be possible through the model of development espoused by the United Nations Development Programme (UNDP) and the World Bank. He stated that many of the problems experienced in the developing world are a result of the development models we follow, not a divinely ordained process. Promoting a development model derived from Western values and based on consumerist growth increases inequity, causes cultural alienation, loss of cultural wisdom and environmental degradation.

Professor Ambrose Adebayo echoed these ideas in his keynote paper at the conference *African Solutions: Towards Sustainable Urban Development* (Pretoria, 27-28 March 2000). He suggested that the cultural dominance and imposed concepts of the various European colonisers contributed greatly to the problems currently experienced in African cities. The adoption of the new Western "sustainable" city patterns requires questioning, to ensure these reflect the specific requirements of African society and incorporate African value systems.[12]

At the same conference, Dr Bernardo Pedro Ferraz of the Environment Ministry of Mozambique pointed out that:

> "*Frequently we end up in a situation where we lose the initiative for the development of our own countries and where our society is organised according to global development theories, rather than according to local aspirations, needs and capacities. In other words we are alienated from our own development process.*"

Ferraz noted that the imposed conditions of Western funding have often led to inappropriate project briefs and designs, and long-term devastating social and political effects. However, Ferraz suggests the most alarming effect of introducing Western development models into Africa can be found on the local culture and self-esteem.

Mamadou Dia of the World Bank attributes the failures of development programmes in Africa to a failure of the traditional Western approaches to fully take into account the political and socio-cultural values that influence decision-making,[13] He criticises institutional development projects for incorrectly assuming that:

- Africa's development should be stimulated from the outside through transfer of culture, institutions, methods and techniques from the industrialised Western countries; and …
- that any society has the same basic values and goals that characterise the "developed" countries – that is, spirit of enterprise, profit motive, material security, and self-interest. Countries not exhibiting such values and goals are viewed as primitive and underdeveloped.

However, the criticism levered against a "sustainable" development model that requires the imposition of a Western value system on the developing world does not imply an outright rejection of sustainable development. Instead, in the words of Iba Der Thiam:

> *" …the way is simple. It does not mean exalting or restoring every bit of Africa's social heritage…. Nor does it mean rejecting everything history brought us from Europe and elsewhere. It means examining our real culture for the permanent values which created the unity, stability, solidarity and cohesion of ancient societies…and to add to this canon selected values, not just from Europe… but from civilisations and cultures from all over the world."*[14]

2.5 Sustainable human settlements

"Human settlements mean the totality of the human community – whether city, town or village – with all the social, material, organizational, spiritual and cultural elements that sustain it. "
Vancouver Declaration on Human Settlements, 1976

Sustainable human settlements are those cities, towns, villages and their communities which:

- enable societies to live in a manner that supports the state of sustainability and the principles of sustainable development, and
- have institutional, social and economic systems that will ensure the continued existence of those settlements.

Whether a settlement can be declared sustainable or not depends on the interaction of four different patterns:

- *The physical structure* – how the settlement sits within the natural environment and therefore responds to the topography, the spatial relationship between the different parts of the city, and the form of the built environment.
- *The use patterns* – which are formed by the way the settlement uses its resources and is described by the infrastructure and services provided.
- *The social patterns* – how people live, learn and work in, and relate to, their settlement, and the opportunities provided by the settlement for meeting these social needs.
- *The operational patterns* – how the settlement functions and is managed.

Sustainable development holds certain very specific and often conflicting demands and conditions for the creation of these patterns. These conditions are also different within different economic, ecological, geographical, topographical and social contexts. It is therefore not possible to define a physical blueprint for sustainable human settlements. However, an attempt has been made to create a normative description or standard that could be applied as appropriate to the creation of settlements everywhere, while at the same time following a process which is locally specific. This is provided by the Habitat Agenda.

2.5.1 The Habitat Agenda

Since the 1992 Earth Summit in Rio, when the international community committed itself to sustainable development, and Agenda 21 was formulated as an international benchmark for sustainable development, all sectors of society have been in the process of interpreting and pursuing sustainability and sustainable development within their specific contexts. The ability to meet most of our basic human needs relates in one way or another to the creation and performance of human settlements, and Chapter 7 of Agenda 21 saw the creation of sustainable human settlements as integral to the achievement of sustainable development.

To address the role of human settlements in sustainable development, a second international action plan, the Habitat Agenda, was prepared. The Habitat Agenda outlines a global approach to providing adequate shelter for all and developing sustainable human settlements and is the international consensus document describing the qualities and needs of sustainable human settlement development.

The Habitat Agenda offers, within a framework of goals, principles and commitments, a positive vision of sustainable human settlements where all have adequate shelter, a healthy and safe environment, basic services, and productive and freely chosen employment.

However, the Habitat Agenda provides such a diverse range of environmental, economic, social, political, demographic, institutional and cultural goals that most governments or international agencies can characterise some of what they do as contributing towards sustainable development. This includes goals whose achievement in one sector or location implies a move away from the achievement of sustainable development goals in another sector or location.[15]

2.5.2 Human settlement indicators

Indicators provide an important tool for mapping the sustainable development process and for monitoring the sustainability of our settlements. Internationally, two sets of indicators have been developed to assist countries in reporting on their implementation of Agenda 21 and the Habitat Agenda, and thus on their progress on sustainable development strategies, policies and activities, and to monitor local conditions for sustainability.

The United Nations Commission for Sustainable Development (CSD) has developed a preliminary set of 134 indicators, of which only 74 were evaluated as being suitable for South Africa. The South African evaluation team has also developed a further 48 new indicators, specifically for South Africa. These indicators are arranged according to their relevance to each of the Agenda 21 chapters. The following are the indicators identified for the promotion of sustainable human settlement development:

- Rate of growth of urban population
- Per capita consumption of fossil fuel by motor vehicle transport

- Human and economic loss due to natural disasters
- Percentage of population in urban areas
- Area and population of urban formal and informal settlements
- Floor area per person
- House price-to-income ratio
- Infrastructure expenditure per capita.

The United Nation's Commission for Human Settlements, UNCHS (Habitat), has developed a set of 23 key indicators and nine lists of qualitative data.[16] These indicators are supposed to measure performances and trends in the 20 selected key areas, and measure progress in the implementation of the Habitat Agenda. Indicators provide a comprehensive picture of cities, which, with other indicators that may be chosen by countries, will provide a quantitative comparative base for the condition of cities, and show progress towards achieving urban objectives.

Two different types of data are required in the minimum data set:

- *Key indicators*, comprising indicators which are both important for policy and relatively easy to collect.
- *Qualitative data* or check-lists, which give an assessment of areas which cannot easily be measured quantitatively.

A list of the UNCHS Urban Indicators is included in Appendix A.

South Africa has also developed its own set of indicators for National State of the Environment Reporting, including a set of Human Settlement Indicators.[17] The human settlement indicators focus on urban decay, urban sprawl and densification of human settlements. However, a number of human settlement-related indicators, such as access to water and sanitation, can also be found under the integrated indicators. In addition, the cities of Cape Town, Johannesburg, and Pretoria have each developed their own sets of indicators under the Cities Environment Reporting on the Internet (CEROI) programme. The Human Rights Commission is developing socio-economic rights protocols and is using certain social indicators such as

- the harmful effect of atmospheric, soil and water pollution on communities;
- the extent of atmospheric, soil and water pollution;
- measures instituted to prevent atmospheric, soil and water pollution and ecological degradation;
- assistance given to communities harmed by pollution;
- monitoring of atmospheric, soil and water pollution; and
- information disseminated to inform the public of its rights and the potential threat to its health.

Eskom, the largest energy provider in Africa, and Rand Water are both developing sustainability indicators for their businesses.

These indicator sets by themselves are not a measure of sustainability, but rather provide a means of monitoring whether conditions have improved or not, and provide an early warning system for imbalances within the local, regional and global socio-economic and biophysical systems.

2.5.3 Sustainable urban structure and form

Few would argue that urban structure and form have no role to play in the sustainability of human settlements. Urban structure and form determine both quality of life and resource efficiency, and can be a key determinant of socio-economic equity, as illustrated by the consequences of the apartheid city.

An alternative model which can assist in visualising one possible form of a more sustainable urban form is the Compact City. It is described as a dense and socially diverse city where economic and social activities overlap and where communities are focused around neighbourhoods. It is seen as growing around centres of social and commercial activity located at public transport nodes. These provide the focal points around which neighbourhoods develop. The Compact City is a network of these neighbourhoods, each with its own parks and public spaces and accommodating a diversity of overlapping private and public activities, leading to the formation of a polycentric city.[18]

The compact city ideal rests on two principles – integration and densification.

The integration principle calls for both integration of functions (or mixed-use) and integration of the different classes of society. In theory, integration of functions such as residential, commercial, social services and public space, would bring jobs and other opportunities closer to where people are living, thus reducing transportation needs. In practice

this seldom happens if the second aspect of integration – socio-economic integration – is not present.

Densification combats urban sprawl and provides economies of scale for effective and affordable service delivery for certain types of services. It is an appropriate response in areas where high levels of services, such as waterborne sewage and full electrification, are provided at an affordable rate, and where there is an acceptable ratio between residential density (number of dwellings) and population density (people per square metre). However, if these conditions are not present, densification may actually be detrimental. It may be worth remembering why the dense city model was so categorically rejected in the last century and the concepts of Garden Cities and New Towns became so popular. The industrial cities of the 19th century suffered extremes of overcrowding, poverty and ill health, resulting in life expectancies of as little as 25 years.[19] It was these very conditions that gave rise to the sanitary revolution that became the forerunner of the Brown Agenda. Today informal settlements are prime examples of areas of extremely high density, with the benefits of high density living, such as closer social contacts and larger support networks, but where inadequate service levels, overcrowding and proximity are creating serious health problems and increased fire risks.

To confound the planners even further is the fact that all over the world people who can afford it are deserting higher density urban environments for their inferior (according to sustainability criteria) suburban equivalent. There are two main reasons for this. Declining household size means that a given density of housing supports a declining number of people; and as people become wealthier, they require more space for themselves, their possessions and their activities.[20]

Higher density is therefore not a sure-fire recipe for sustainable urban form, and may not be an appropriate response in rural areas at all, where other factors such as extended family living and food security play a large role in the spatial requirements of the settlement.

It can therefore be argued that, instead of thinking of integration and densification as two absolutes, they should rather be based on the principles of diversity and choice. Diversity would allow for a range of opportunities for diverse groups of people. Integration would increase diversity and choice. Choice refers to the availability of different options to different people and this is also applicable in terms of densities. Some people may choose to stay closer to economic opportunities and will therefore have to be content with higher density living, due to increased land values and higher rents. They will, however, save on transportation costs. Others may choose to live on the urban periphery, where they can afford a larger plot and a house and supplement their incomes through home-based enterprises and subletting, as well as having room for subsistence living. A sustainable city in South Africa will therefore have to make provision for different income groups and different preferences, while ultimately striving towards more compact development.

2.5.4 Sustainable cities

A sustainable city is more than its physical form. Peter Hall describe seven essential dimensions to a sustainable city[21]:

- A sustainable urban economy providing work and wealth.
- A sustainable urban society with social coherence and social solidarity.
- Sustainable urban shelter providing decent, affordable housing for all.
- A sustainable urban environment with stable ecosystems.
- Sustainable urban access through resource conserving mobility.
- Sustainable urban life – the liveable city.
- Sustainable urban democracy through an empowered citizenry.

A slightly more poetic interpretation is offered by Richard Rogers[22], who describes the sustainable city as a city of many facets:

- a Just City, where justice, food, shelter, education, health and hope are fairly distributed and where all people participate in government;
- a Beautiful City, where art, architecture and landscape spark the imagination and move the spirit;
- a Creative City, where open-mindedness and experimentation mobilise the full potential of its human resources and allows a fast response to change;
- an Ecological City, which minimises its ecological impact, where landscape and built form are balanced and where buildings and infrastructures are safe and resource-efficient;
- a City of Easy Contact, where the public realm encourages community and mobility

and where information is exchanged both face-to-face and electronically;
- a Compact and Polycentric City, which protects the countryside, focuses and integrates communities within neighbourhoods and maximises proximity; and
- a Diverse City, where a broad range of overlapping activities creates animation, inspiration and fosters a vital public life.

How these dimensions are manifested in different settlements is entirely a function of local conditions, culture, levels of commitment and, most importantly, the basis on which decisions are made. As described in Chapter 1, urban sustainability is a multi-dimensional problem that requires a systemic approach. The decision-making processes of a sustainable city would therefore also be different from traditional approaches. In practice this means a move from hierarchical and sectoral decision-making to a more holistic, integrated and participative approach.

According to Agenda 21 and the Habitat Agenda, integrated planning and sustainable development go hand in hand. Integrated planning is concerned with the overall behaviour of a regional system and its sub-systems, as linked together by fluxes of material and energy. The concept of integrated planning further implies that technical solutions are no longer the most important aspect in decision-making, but should be seen as only one part of the problem-solving process.[23] At an urban level, integrated planning takes all the conditions and circumstances that will play a part in the successful outcome of the plan into account, and involves all the people or organisations who have a role to play or a contribution to make.[24] It should generate "optimum" solutions that give the best overall performance for the environment and the socio-economic system, and enough flexibility to allow for changes to reflect changing conditions.

However, for integrated planning to be successful, it should be based on a good understanding of the make-up of the urban system, and then prioritise actions according to the dynamics of the system. Where integrated planning is based on strategic planning according to priorities identified early on in the public participation process, critical parts of the system can be left out of the equation, leading to unexpected problems further down the line, or even the collapse of the entire system. Basing decisions on current developmental priorities alone (focusing only on certain parts of the system), and ignoring the system's dynamics of settlements, can result in intuitive, "feel-good" decisions that provide short-term solutions, but undermine the long-term sustainability of these settlements.

2.6 Conclusions

It is clear that there are no one-size-fits-all answers to the creation of sustainable human settlements. The whole thrust of international documents is that principles can and should be shared but that local outcomes should be unique, which summarised in the saying, "Think globally, act locally". The sustainability of a settlement relies on the following factors:
- the economic approach (weak or strong sustainability) that is followed;
- the balance between the principles of the Brown and or Green agendas;
- the basis on which planning decisions are made (systemic or mechanistic); and
- the type of settlement that is being analysed.

In South Africa the complexity of our settlement typologies has a particular role to play in the sustainability profile of each of our human settlements, and any discussions have to be based on a thorough understanding of this complexity. Chapter 3 provides a broader explanation of the settlement typologies found in South Africa, and identifies the case studies that were chosen for this study.

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Chapter 3: Contextual typologies

3.1 Introduction

Sustainable development is very dependent on the particular local context in which the settlement development is taking place. It will therefore mean different things for different settlement types or, seen from the other side, different settlement types will have different implications for sustainable development and ultimately for achieving settlement sustainability. Understanding different settlement types in South Africa therefore becomes crucial to the sustainable development debate in this country.

The previous chapter described what is understood by "sustainable human settlements" and has already alluded to a difference in scale (including cities, towns and villages), as well as to different areas within the cities or towns, such as suburbs and inner city areas. Settlements are not uniform and a variety of settlement types are prevalent. Settlement typology can be defined as the study and interpretation of settlement types.

It is not always easy to identify and distinguish these different settlement types because of a multitude of complex factors that play a role in differentiating one settlement from another, such as topography, location, size, proximity and management structures. This is also the case in South Africa.

3.2 South African typologies

A number of observers and policy guideline documents have identified settlement typologies in South Africa. These are used below to distinguish between settlements which differ according to size, location and institutional management. In some cases settlement and housing typologies have also been used together, due to difficulties in separating them.

3.2.1 Settlement typologies

A number of different sets of settlement typologies have been identified for South Africa. The *Urban Development Strategy* (1995)[1] distinguishes between different settlements on the basis of size and identifies four principal city size classes: large metropolitan areas (over two million); large cities (500 000 to two million); medium sized cities (100 000 to 500 000); and small cities and towns (up to 100 000). Since the strategy had an urban focus, it did not include any rural towns, villages or farmsteads.

The *White Paper on Local Government*[2] extended the interpretation of settlement types in South Africa to include rural settlements as well. These settlement types were distinguished on a more random basis, including size, location, function and tenure type. The document also differentiates between a hierarchy of types, ranging from urban (urban core and urban fringe with various sub-parts) to rural settlements (including former homeland settlements named "betterment" settlements with more than 5 000 people, informal settlements with more than 5 000 people, rural villages with less than 5 000 but more than 500 people, agri-villages servicing commercial farming areas and dispersed settlements which are mostly unplanned homestead settlements with less than 500 people). The criteria for identification of different settlement types are not always consistent.

Ian Palmer[3] uses a more simplified settlement typology consisting of urban core, urban fringe, dense rural, villages, scattered settlements and farms.

The *State of Human Settlements Report*[4] identified two sets of typologies for human settlements in South Africa, based on size and location. Settlements were divided into six typical settlement sizes in two broad categories, urban and rural: metropolitan areas (more than 500 000); cities or large towns (50 000 – 500 000); small towns (less than 50 000); displaced urban or dense rural (less than 50 000); rural villages (500 – 5 000) and scattered or dispersed settlements (less than 500).

The locational typology expanded the two broad categories and distinguished between urban core (higher density developments near the city centre) and urban fringe (generally lower density developments on the urban periphery). It also identified displaced urban or dense rural settlements as those that are some distance away from large agglomerations. This typology was further developed to include different settlement types (sub-types) in each of the three broad categories.

Urban Core	Urban Fringe	Displaced urban or dense rural
Core informal settlements	Fringe informal settlements	Peri-urban traditional tenure/mixed settlements
Core townships	Fringe townships	Former homeland border towns and townships
Inner city high-rise flats	Collective dwellings	Agri-villages
Inner city houses	Informal settlements	Peri-urban informal settlements
Squatting in disused buildings	Fringe suburbs	Informal settlements in commercial farming areas

Settlement types as identified in the State of Human Settlements Report (1999)[5]

Although it gives a very accurate reflection of South African settlements, it includes a combination of settlement and housing types. While it is very difficult to separate settlement and housing types in many cases. Their combination into one typology can become extremely complex and often adds to difficulties in analysing the existing state of human settlements. This said, it is acknowledged that housing types often define a specific settlement type to a large extent, for example shacks (informal housing) in an informal settlement, and this may be the reason why settlement and housing typologies are often combined.

3.2.2 Housing typologies

While this report focuses primarily on settlements in South Africa, it acknowledges that housing plays a very important role as one of the defining and indicative components of specific settlement types. In this regard it is important to be aware of the different housing typologies present in the South African context. Statistics SA[6] (in the 1999 October Household survey) define different dwelling types: formal (houses, flats, townhouses, rooms, flatlets), informal (shacks, shanties), traditional (huts or other structures made out of traditional materials) and other (houseboats, tents, caravans). These types area used to relate most of the infrastructure statistics.

3.2.3 Tensions and misunderstandings

The study of different settlement typologies often gives rise to a number of tensions and misunderstandings, because of the complex nature of settlements in South Africa, as well as the combination of typologies. As illustrated, settlement typologies according to size and location are often combined with housing typologies. Most of the current typologies are in fact a mixture of these. In addition, settlements are also often defined according to income and or tenure type.

South African settlements are to a large extent characterised by major economic differences between traditional suburbs, townships and informal settlements; as well as between large metropolitan areas (often with huge economic resources and high GDPs) and small rural towns. The economic differences are often exacerbated by great distances between different settlement types and levels of affordability. In these terms one can almost start to refer to many settlements as split into rich city and poor city.

3.3 Typologies used in this study

It is not the immediate purpose of this study to develop the ultimate definition of human settlement types in South Africa. The study acknowledges, rather, the complex nature and continued transformation of human settlements in South Africa and therefore realises the difficulties in defining specific boxes and categories. Yet, in order to analyse the sustainability of human settlements in this country, one needs to have a relatively representative model of different settlement types to highlight the successes and problems experienced by different settlements.

The purpose of the settlement typologies is therefore to provide a tool for the systematic and representative analysis of South African settlements and its different components, of which housing is one.

This has led to a multi-levelled typological approach in which the study identifies three sets of typologies that are instrumental in highlighting three major aspects (size, location and municipal structure) of settlements in South Africa. This is not to imply that there are no other sets of typologies, but that these repeatedly feature as major role-players in terms of the sustainability of human settlements in South Africa. In addition, a differentiation between urban and rural is often made within the different sets of settlement typologies. While the definition of “urban” and “rural” is hotly debated[7], and current estimates of population vary according to the different

definitions, demographers in South Africa generally agree that the proportions of South Africans who are living in urban areas will rise.[8] In addition, a number of settlements are simultaneously urban and rural – for example, displaced settlements that were established as commuter settlements during the apartheid era outside the edges of traditional cities.

3.3.1 Dimensional typologies

The size of a settlement plays an important role in its sustainability, and influences a number of drivers and pressures in different ways. For the purpose of this study, settlements in South Africa are broadly divided into seven typical settlement sizes.

	Approximate sizes	Examples
Large cities / metropolises	> 2 000 000	Johannesburg, Cape Town, Durban
Medium cities	> 500 000 - < 2 000 000	Bloemfontein, Pietermaritzburg, East London.
Small cities / large towns	> 100 000 - < 500 000	Kimberley, Pietersburg, Potchefstroom.
Small towns	< 100 000	Upington, Ficksburg, Ladysmith.
Large rural village	> 5 000 - < 50 000	
Small rural village/ scattered settlements	< 5 000	

Table: Typical settlement sizes

Displaced urban settlements or dense rural areas in South Africa can vary in size, but usually have more than 50 000 people. Examples include Bushbuckridge, Winterveldt and Atlantis.

3.3.2 Geographical typologies

The second set of typologies is concerned with the location of settlements, i.e. the geographical distribution of broad settlement types and their sub-types. In this regard settlements may be located in the core of cities, on the fringe or periphery of cities, or some distance away from cities. Because of apartheid, these locational typologies also have clearly defined economic divisions.

Broad category	Sub-types
Urban core	CBD / mixed use area Core informal settlements Core township Core suburb
Urban fringe	Fringe informal settlement Fringe township Fringe suburb/ edge city
Displaced urban and/or rural	Displaced townships Peri-urban informal settlements Former border or homeland towns
Rural	Rural towns and villages Agri-villages Farm villages/ homesteads

Table: Geographical typologies

Urban core settlements are those areas that are located close to the traditional city core or business area. They generally have higher densities (> 10du/ha), which are often achieved through higher-rise buildings or smaller plot sizes. These areas are also characterised by high levels of economic activity and consequently higher land values.

Sub-types	Definition
CBD / mixed-use area	High-density, often high-rise areas with a large proportion of commercial and business land uses, sometimes combined with high-rise residential buildings in areas such as Hillbrow in Johannesburg or Albert Park in Durban.
Core informal settlements	Previously or currently illegal and unplanned settlements within inner cities or towns close to the traditional CBD or areas of employment, mostly with shacks as the predominant housing type (e.g. parts of Cato Manor in Durban, parts of Alexandra in Johannesburg, and Duncan Village in East London).
Core township	Formal mass-built settlements (old or new) within inner cities or towns close to the traditional CBD or areas of employment (e.g. formal township of Alexandra in Johannesburg).
Core suburb	Lower-density, low-rise areas of single houses close to the inner city centre (e.g. Arcadia in Pretoria and lower Berea in Durban).

Table: Urban core settlement types

Although these sub-types represent broad settlement types in the urban core, many are becoming increasingly mixed-use in nature, especially the CBDs and core suburbs.

Urban fringe settlements refer to settlement types that are located within the larger urban or municipal boundaries, but outside the urban core. They generally have lower densities,

except for some township areas and especially informal settlements that often have higher densities, but in terms of du/ha and number of people/du.

Sub-types	Definition
Fringe informal settlement	Freestanding, previously or currently illegal and unplanned settlements (mostly with shacks) located far away from the traditional CBD and often far from places of employment as well, resulting in extensive commuting patterns, e.g. Inanda in Durban, Cross Roads in Cape Town and parts of Ivory Park in Midrand.
Fringe township	Formally planned and mass-built settlements (often with backyard shacks) located far away from the traditional CBD and often far from places of employment, e.g. Soweto in Johannesburg, KwaMashu in Durban, and Khayelitsha in Cape Town.
Fringe suburb/ edge city	Low-density, low-rise areas of single or townhouses (mostly medium to high income) and often planned as neighbourhood units with a closed road network system (typical suburban layouts). These areas are located at moderate to long distances from the traditional CBD, but are generally well connected through rapid transport roads (e.g. Sandton and Randburg in Johannesburg, Westville in Durban and Claremont in Cape Town). In some cases suburban residential areas develop into mixed-use settlements with decentralised commercial nodes operating as almost autonomous edge cities.

Table: Urban Fringe Settlement Types

While large cities and towns easily lend themselves to a clear distinction between the urban core and the urban edge, these differences are often difficult to identify or irrelevant to small towns, which generally only have a central business and commercial area, surrounded by a suburban area, and often separated from the township and informal settlement(s).

Displaced urban or rural settlements are those settlement types that are located at moderate to long distances from urban areas and often fall outside the urban growth or municipal boundaries. As mentioned earlier, these areas can simultaneously be urban or rural. They generally have higher densities with limited employment opportunities close by, resulting in extensive commuting patterns and high unemployment.

Sub-types	Definition
Displaced townships	Dense, formally planned and mass-built settlements located at moderate to long distances from the nearest cities or towns (e.g. parts of Botshabelo in the Free State, Winterveldt north of Pretoria and Diepsloot near Johannesburg).
Peri-urban informal settlements	Dense, unplanned settlements comprising mostly non-traditional dwellings and located far away from the nearest cities or towns (e.g. Loskop in KwaZulu-Natal and parts of Botshabelo in the Free State).
Former border or homeland towns (also known as "betterment areas")	Dense, planned settlements located in former homeland areas that are sometimes adjacent to decentralised industrial areas (e.g. Siyabuswa in the former KwaNdebele, Bisho in the former Ciskei and Butterworth in the former Transkei).

Table: Displaced urban and/or rural settlement types

Rural settlements refer to settlement types that are located in non-urban and sparsely populated areas in which people farm or depend on natural resources. They are therefore settlements that pre-dominantly serve an agricultural community and generally have lower densities, except for some township and informal settlements.

Sub-types	Definition
Rural towns and villages	Small rural settlements that are planned (mainly residential with a small number of commercial and business premises) or unplanned (traditional or resettled areas).
Agri-villages	Planned, dense settlements in rural areas servicing the surrounding farms and mainly act as dormitory areas for farm workers.
Farm villages/ homesteads	Mostly unplanned homestead settlements located on privately or collectively owned farms.

Table: Rural settlement types

According to the 1996 census 55,4% of the population in South Africa lives in urban areas.[9] It is however estimated that by the year 2020 75% of the population will live in urban areas.[10]

3.3.3 Institutional typologies

The third set of typologies is concerned with the municipal structures and methods of governance in South Africa. The Local

Government Municipal Structures Act (1998) identifies five types of local municipalities that fall within three types of categories, namely metropolitan, local and district municipalities. The five types include a collective executive system, a mayoral executive system, a plenary executive system, a subcouncil participatory system, and a ward participatory system.

Three categories of municipalities are defined in the Act. *Category A* refers to a metropolitan municipality and requires the following from a municipality to be classified as a category A municipality:

- A conurbation with the following features:
  - areas of high population density;
  - area with intense movement of people, goods and services; and
  - area with multiple business districts and industrial areas.
- A centre of economic activity with a complex and diverse economy.
- A single area for which integrated development planning is desirable.
- An area with strong interdependent social and economic linkages between its constituent units.

Eight types or combinations of types are possible in this category.

A *Category B and C* area refers to local (B) and district (C) municipalities and the criteria are only defined as those which do not comply with above criteria. Six types or combinations of types possible are possible in category B and three in category C (see table with new municipal structures).

A category C municipality specifically refers to a district council, made up of a collection of local municipalities.

Municipal governance structures are therefore made up of a combination and categories and types, as well as a combination of different types, where appropriate, for example a Category A municipality can have a type 1 governance structure combined with a type 4 structure, to therefore be a metropolitan municipality with a collective executive system and sub-council participation.

	Category A	**Category B**	**Category C**
Type 1	Collective executive system	Collective executive system	Collective executive system
Type 2	Mayoral executive system	Mayoral executive system	Mayoral executive system
Type 3	-	Plenary executive system	Plenary executive system
Type 4	Subcouncil participatory system	-	-
Type 5	Ward participatory system	Ward participatory system	-

Table: New municipal structures

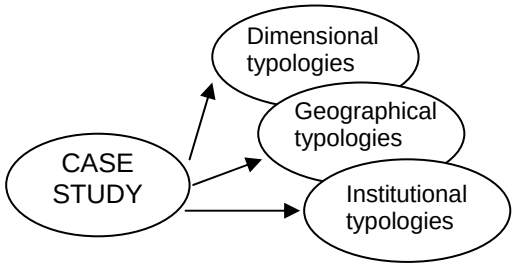
3.3.4 Multi-typological approach

The multi-typological approach outlined above is used to understand and distinguish different settlement types in South Africa, and to identify specific problems and challenges faced by different settlement types in relation to size, location and institutional structures.

3.4 Case study selection

The multi-typological approach is also used to ensure a fair and representative selection of case study areas in South Africa and each case study area therefore has three layers of typologies.

Seven case study areas were selected to include a range of provinces, spatial and



locational combinations, institutional types and sizes. The case study areas include: City of Johannesburg, Buffalo City, Winterveldt, Kimberley, Clarence and Warden, Mathabatha and Naledi Village.

The distribution of different typologies across the different case study areas can be seen in relation to each other in the following table.

CASE STUDIES	Settlement typologies		
	Dimensional typologies	*Geographical typologies*	*Institutional typologies*
Johannesburg Province: Gauteng	Large City (> 2 000 000) Population: 2.83 million	Urban core (CBD, Informal settlements, suburbs) urban fringe (Informal settlements, townships, suburbs and peri-urban) and displaced urban settlements (informal settlements, townships).	City of Johannesburg Metropolitan Municipality Category: A Type: Mayoral executive with Ward Participatory
Buffalo City Province: Eastern Cape	Medium City (> 500 000 - <2 000 000) Population: ± 900 000	Urban core (CBD, informal settlements, township, suburbs), urban fringe (informal settlements, townships, suburbs) and displaced urban settlements (townships, peri-urban traditional settlements, border/former homeland towns).	Buffalo City Municipality Category: B/C? Type: Mayoral Executive with Ward Participatory
Kimberley Province: Northern Cape	Small City/Large Town (> 100 000 - < 500 000) Population: ± 210 000 (TLC)	Urban core (CBD, suburbs) urban fringe (informal settlements, townships) and displaced urban settlements.	Kimberley Municipality Category: B/C? Type: Collective Executive with Ward Participatory
Winterveldt Provinces: Gauteng and North-west Province	Displaced urban settlement Population: 240 000	Displaced township and informal settlement.	Part of City of Tshwane Metropolitan Municipality Category: A Type: Mayoral executive with Ward Participatory
Clarence and Warden Province: Free State	Small Town (< 100 000) Population of Clarence (including Kgubetswane): 5 745 Population of Warden (including Ezenzeleni): 6 805	Small towns with small central business and commercial areas surrounded by residential development (suburbs and township).	Clarence is part of Dihlabeng Municipality. Category: B/C? Type: Collective Executive with Ward Participatory Warden is part of Phumelela Municipality. Category: B/C? Type: Plenary Executive with Ward Participatory
Mathabatha Province: Northern Province	Large rural village (> 5 000 - < 50 000) Population: 27 900	Collection of 13 rural villages with a combination of formal and traditional housing areas and a few scattered businesses under the leadership of the local chief.	Part of Lepelle-Nkumpi Municipality Category: B/C? Type: Collective Executive
Naledi Village Province: Free State	Small farm village (< 5 000) Population: 150	Farm village	Part of Sesotho Municipality Category: B/C Type: Collective Executive with Ward Participatory

Table: Case study areas with different layers of settlement typologies

The selection of case studies therefore represents a range of different settlement sizes (from a large metropolitan area to a very small farm village) with a wide variety of geographical types (including different spatial distribution patterns and relationships), as well as different institutional structures.

3.5 Conclusion

South African settlements can be categorised into multi-dimensional typologies and should therefore be considered through a superimposition of different and relevant typologies. The case study areas that have been selected for the purpose of this study aim to represent this multi-dimensionality and its relation to the sustainability of human settlements in South Africa. However, this said, it is often very difficult to create definitive boxes, because successes and problems are not always applicable to a specific type or may be influenced differently due to a specific combination of types. This study will therefore make use of the broad categories identified in

this chapter in a flexible way, with the understanding that no categorisation is absolute. The next chapter will deal with the specific model used to analyse the sustainability of the different settlement types in South Africa.

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[1] Urban Development Strategy (1995) Government of National Unity, p. 2.
[2] White Paper on Local Government (1998) Department of Provincial and Local Government, Government Gazette, 13 March 1998, pp 32-33.
[3] Palmer, I (1997) Local Government: Its role in service delivery. http://www.local.gov.za/DCD/policydocs/whitepaper/cl2ian2.htm
[4] CSIR (1999) The State of Human Settlements: South Africa 1994 – 1998. Prepared for the Department of Housing by CSIR Building and Construction Technology, Pretoria.
[5] Ibid. pp. 4-5.
[6] Statistics South Africa (2000). RSA Statistics, 2000. Stats SA, Pretoria.
[7] White Paper on Local Government 1998 p. 32.
[8] Urban Development Strategy (1995) Government of National Unity, p. 10.
[9] Statistics South Africa (1996). RSA Statistics, 1996. Stats SA, Pretoria.
[10] Urban Development Strategy (1995) p 9.

Chapter 4: Towards a framework for analysing the sustainability of human settlements in South Africa

4.1 Introduction

The overarching methodological framework proposed for the sustainability analysis is based on the internationally accepted Driver-Pressure-State-Impact-Response model (abbreviated to "DPSIR") developed by the Organization of Economic Co-operation and Development (OECD). The framework is probably the most widely accepted causal framework for sustainability assessment and analysis, largely for its simplicity and the fact that it can be applied at any scale.

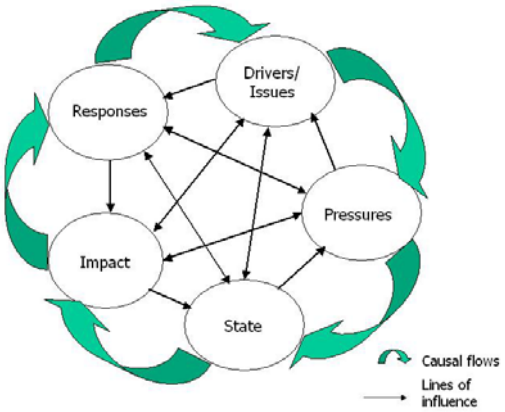
However, to determine the current state of settlements an additional set of factors had to be used. The framing of these factors was based on a set of requirements drawn from international descriptions of the characteristics of a sustainable settlement as measured by certain indicators. The factors include

- the quality of life provided by the settlement,
- its relationship with its biophysical environment and
- its institutional functioning.

The study had to further recognise that the sustainability profile would be different for each of the different types of settlement found in South Africa, and even for settlements of the same type, depending on a range of contextual factors. To capture as wide as possible a range of differences between the settlement types, a broad-brush analysis was made of the seven different case study areas identified in Chapter 3.

4.2 The dynamic DPSIR framework

Within the DPSIR framework human activities and external forces (the **drivers**) are seen as producing **pressures** that can induce changes (**impacts**) in the state of the biophysical and socio-economic environments and thus on the **state** of human settlements. Society then **responds** to changes in pressure or state with policies and programmes intended to prevent, reduce or mitigate pressures and their impacts. These responses in turn produce new pressures. Additional to the simple causal flow from drivers to responses are the dynamic relationships between all five aspects as described in the following diagram.



The DPSIR Model

The **driving forces/issues** represent human activities, processes, patterns and external influences that impact on sustainable development. These are the forces of change, such as urbanisation, demographic change, economic activity, policy development, HIV/AIDS and climate change. Other underlying societal drivers include the social and technological forces that motivate or otherwise drive human activities, which in turn cause many of the direct pressures on the biophysical environment and socio-economic development.

The **pressures/ causes of the issue** are the consequent pressures of human activities on the environment and socio-economic development. A distinction can be drawn between indirect (or distant) pressures and proximate pressures.

- *Indirect pressures* are background pressures reflecting human activities that lead to direct pressures. They are the human activities (mostly economic) related to human sustenance or the improvement of human welfare (e.g. industrialisation, service delivery), plus natural processes (e.g. meteorological events), which create direct biophysical pressure on the environment and its ability to sustain human activities.
- *Proximate pressures* are those that are directly exerted on the environment, expressed in terms of emissions or consumption of natural resources, or on society – e.g. the shift from an agricultural economy to a knowledge economy.

The **state** describes the current condition of human settlements and the biophysical environment, including the environmental quality, levels of access to services, and ability to support human development.

The **impacts** describe the human health and environmental consequences of the state of settlements, such as the effects of poor water and air quality, continued social exclusion and loss of livelihoods.

The **responses** describe policy options and other responses to the state of human settlements which are aimed at changing those settlements and reducing environmental impact. Societal responses refer to individual and collective actions to mitigate, adapt or prevent human-induced negative impacts on the environment (including human settlements). Current policies and management strategies are described, their effectiveness is evaluated and recommendations are made for additional activities and policy development.

4.3 Determining the sustainability profile of the current state of settlements

As a signatory to the Habitat Agenda, the South African Department of Housing has taken responsibility for interpreting the principles of the Habitat Agenda into the local context. The Habitat Agenda is also used as the framework for the country's reporting to the United Nations Commission on Human Settlements. Therefore this investigation uses the Habitat Agenda as the benchmark against which to analyse the sustainability of human settlements in South Africa.

The Habitat Agenda (Chapter 3b) defines a sustainable human settlement as one

- making efficient use of resources within the carrying capacity of ecosystems and taking into account the precautionary principle approach;
- providing all people with equal opportunities for a healthy, safe and productive life in harmony with nature and their cultural heritage and cultural and spiritual values; and
- ensuring economic and social development and environmental protection.

Using the above as a guideline, the sustainability of human settlements can be determined from three points of departure:

- The quality of life that is offered to each member of society.
- The interaction between the settlement and its biophysical environment and whether this interaction will continue to support an adequate quality of life.
- The ability of the institutional systems responsible for creating, operating and maintaining the settlement to continue providing an adequate quality of life and to do this in a manner supporting sustainability.

4.3.1 Quality of life

The concept of sustainable development had expanded from the very simple meeting of basic needs described in the Brundtland (WCED) definition, to embrace the meeting of the entire hierarchy of human needs, and so provide an acceptable quality of life for all. However, the determinants for an acceptable quality of life are very difficult to define and depend on the context, the prevailing culture and the synergies between different determinants. For instance, while few would disagree with a determinant such as clean air, there are millions who believe that cities, with their high pollution levels, provide a far better quality of life than life in rural areas where they will have clean air. Quality of life is therefore more dependent on the combined effect of a range of factors, rather than the presence or absence of specific factors. The absence of one or more factors does not necessarily mean that the settlement does not provide an acceptable quality of life. There is a large body of literature on quality of life, well-being, urban poverty and, more broadly, sustainable livelihoods[1] on which much of this thinking is based.

Certain key quality of life determinants specifically linked to human settlements have been identified by the Habitat Agenda, the UNCHS Indicators Programme, as well as other indicator programmes such as the CSD Indicators (and South Africa's assessment of them), CEROI initiative (Cities Environmental Reporting on the Internet) and particularly the South African CEROI partners, as well as the Draft Environmental Indicators for South Africa. These quality of life determinants are drawn from the Habitat Agenda definition of sustainable human settlements as providing:

> *"..all people with equal opportunities for a healthy, safe and productive life in harmony with nature and their cultural*

heritage and cultural and spiritual values."

These determinants can be roughly grouped as follows.

Issue	Determinant	Examples of indicators
Health	Adequate sanitation	• Percentage of people with access to a defined minimum standard of sanitation • Percentage of people affected by gastro-intestinal and other sanitation-related diseases • Percentage of people who have received training on hygiene practices and the use of a specific sanitation technology
	Clean water	• Percentage of people with access to clean drinking water and type of access (public tap, /piped water on site or in dwelling) • Percentage of people affected by waterborne diseases • Reliability of service • Percentage awareness of good hygiene practice.
	Clean air	• Level of indoor air pollution/ type of energy used for cooking and heating • Level of ambient air pollution/ Percentage of population affected by air pollution • Percentage of people affected by respiratory disease • Affordability of clean energy sources
	Absence of disease vectors	• Coverage of refuse disposal systems/ Percentage of people with adequate refuse removal • Proximity of waste disposal sites to human habitation • Municipal vector management programmes • Percentage of people affected by diseases caused by inadequate waste management
	Access to health care	• No. of clinics/hospitals per capita • Average distance from health care facilities
Safety	Reduced threat of natural disasters	• Area of settlement within possible disaster areas (flood plains, on dolomitic rock, steep slopes, etc.) • Human and economic loss due to natural disasters • Disaster management programme
	A secure living environment	• Incidences of crime (number, type and location). • Levels of fear of crime • Community safety programmes
	Reduced threat of man-made disasters	• Percentage of households using hazardous energy sources (e.g. paraffin) • Percentage of people living in informal settlements • Proximity of hazardous industries to residential areas • Space available in hazardous waste disposal facilities • Monitoring of industrial effluent
Shelter	Adequate, affordable housing	• Household density (No of people per dwelling) • Percentage of population living in informal settlements • Floor area per person • House price-to-income ratio • Level of services provided • Cost of services as percentage of household income • Quality of housing provided • Security of tenure
	Special needs housing	• No. of orphanages/ 1 000 people • No. of hospices/ 1 000 people • No. of shelters/ 1 000 people • No. of elderly care facilities/ 1 000 people
Productive life	Access to means of living	• Percentage of people unemployed • Percentage of population in poverty (household subsistence level) • Spatial distribution of employment opportunities • Provision for informal sector and rural subsistence

Issue	Determinant	Examples of indicators
	Access to education	• Number of schools/ 1000 people • Spatial distribution of educational facilities • Range of educational facilities available (e.g. tertiary, ABET, special needs, etc.)
	Access to economic resources	• Housing financing support • Housing subsidies allocated as percentage of need. • SMME development support • Right to own and inherit property
	Mobility	• Functional and affordable public transport • Spatial distribution of transport routes and access nodes • Regulations on disability access enforced • Cars per 1 000 people
Self-determination	Connectivity	• Percentage of households with telephone access • Internet service providers per capita • No. of community media services (radio stations & newspapers)
	Access to information	• Accessibility of municipal information • Location of municipal offices • No. of libraries/ 1000 people
	Participation and democracy	• Level of participation in democratic system • Participatory approach to decision-making and development • Full participation by persons with disabilities in all spheres of human settlements
Quality of built environment	Natural heritage	• Percentage of open green space per capita • No. of protected natural heritage sites
	Urban decay	• Percentage derelict area in urban areas • Urban greening initiatives • Maintenance of public open spaces • Maintenance of infrastructure
	Supporting community	• Number of entertainment facilities and sports grounds per 1 000 and their spatial distribution • Maintenance and accessibility of cultural heritage sites • Number of cultural facilities (e.g. theatres, churches, mosques, art galleries)

It was not possible to collect data on all the indicators for each case study, or even at a national level. However, the above structure was used to organise the data captured for each case study and draw conclusions on the quality of life being provided by each case study, as well as at a more general level for a selection of the different settlement types in the geographical typology.

4.3.2 The biophysical interaction

To live in any given physical environment, humans must develop patterns of spatial organisation, which take advantage of opportunities and avoid or minimise the effects of restrictions on settlement. Physical systems and environmental characteristics do not by themselves determine the pattern of human activity or settlements. If the incentives are significant for settlement in an area, it will be achievable, although sometimes at great environmental cost and risk. Human settlements are often designed with the ability to withstand most of the consequences of environmental variability.[2] However, the environment does place limitations on human development, especially where there is a lack of critical resources such as water or arable land. Furthermore, a dysfunctional biophysical environment would severely reduce the quality of life and even survival options of its inhabitants.

Human developmental activity has certain well-documented negative impacts on the biophysical environment, which in turn impact on the quality of life experienced and the ability of the settlement to support sustainable livelihoods. The type of impact a human settlement has on the biophysical environment depends on the scale of the settlement, the level of infrastructure delivery, the levels of resource consumption and the types of development activity pursued.

The biophysical environment in turn poses potential threats through natural and man-made disasters and internal hazards to houses, settlements and residents.

The interrelationship between the biophysical environment and human settlements is illustrated in Figure 2[3].

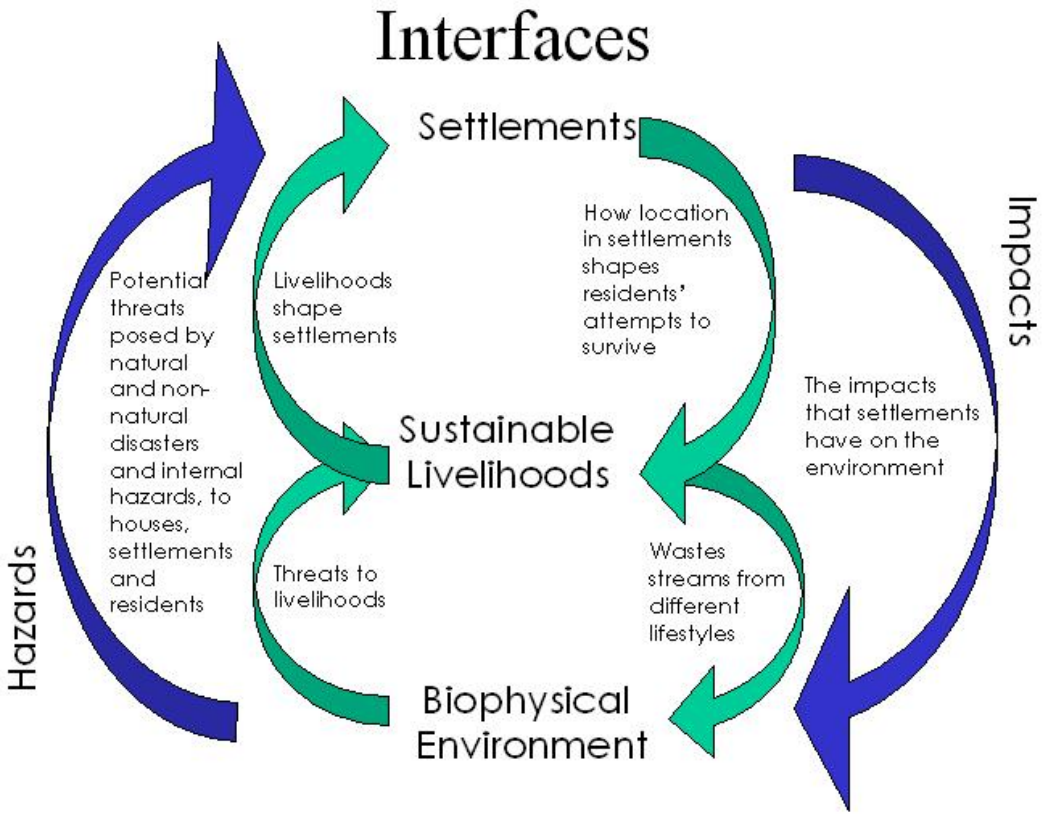


Figure 2 The interrelationship between human settlements and the biophysical environment
Source: M. Napier, CSIR

The Habitat Agenda states that a sustainable human settlement:

> *"Makes efficient use of resources within the carrying capacity of ecosystems and takes into account the precautionary principle approach."*

An ecologically responsible settlement would therefore minimise pollution and waste, as well as the consumption of resources such as water, energy and arable land. At the same time, it would take active steps to ensure the protection of ecologically sensitive sites such as wetlands, areas of high biodiversity, areas crucial to the maintenance of the global life-support systems such as forests, the habitats of endangered species, as well as sites of outstanding natural beauty that form part of the world heritage.

Several indicator sets have been developed for analysing the sustainability of the biophysical environment. However, apart from pollution/ health indicators, few indicators have been developed for measuring the impacts of a deteriorating biophysical environment on human settlements and their inhabitants.

The following are taken from the National Core Set of Environmental Indicators developed by the Department of Environmental Affairs and Tourism, as well as from the South African Cities State of the Environment Reporting.

Issue	Determinant	Indicator
Resource use	Freshwater use	• Per capita water use/ level of water and sanitation services provided • Surface water demand versus available resources • Water-saving programmes
	Land use	• Change of land use over time • Percentage of non-urban land converted to urban use • Urban vs rural population density • Percentage growth of urban areas • Permanent loss of agriculturally productive land
	Energy use	• Energy use per urban user • Energy use per rural user • Energy use per sector (transport, residential, industrial) • Renewable vs non-renewable energy use
	Waste produced	• Total amount of solid waste produced per capita • General landfill airspace supply vs demand • Percentage of solid waste recycled per year • Proportion of treated effluent re-used
Pollution and degradation	Air quality	• Ambient pollutant concentrations • Emissions of greenhouse gases
	Water quality	• Surface water toxicity • Levels of *E.coli* and other recognised pollutants in ground and surface water • Wetland alteration
Protection of environment	Conservation	• Area of land within municipal area having formal conservation status • Current status of Red Data Book species in municipal area • Environmental protection expenditure as percentage of gross city product
	Environmental governance	• Number of EIA applications per year • Number of people committed by local government to environmental management

4.3.3 Institutional ability

Central to the achievement of sustainable human settlements is the ability of local and national government to provide and maintain an acceptable quality of life within the economic and biophysical constraints imposed on them.

While supporting policy and effective regulatory measures is crucial, the real determinants are available institutional resources (financial as well as human), the will to implement policies that support sustainable settlements, operational efficiency and the technical capacity to develop and implement programmes and projects that support sustainable development.

However, there are very few indicators or other methods to determine institutional sustainability. Drawing on a series of other research projects[4], as well as the learning derived from the case studies, the following key issues and determinants were used to gauge the institutional ability to create, operate and maintain sustainable human settlements.

Issue	Determinant
Financial capacity	• Payment levels for services, rates and taxes • Ability of local authority, as well as members of the community, to access external funding • Realistic relationship between income (rates, taxes, equitable share of national income) and expected delivery responsibilities
Institutional integration	• Consistency of boundaries • Cooperation between different spheres of government and types of municipalities
Operational efficiency	• Clear allocation of powers and responsibilities • Adequately skilled human resources • Sufficient human resources
Technical capacity	• Ability to operate and maintain physical infrastructure • Knowledge of alternative technology options for service delivery
Political will	• Development of policy that supports sustainability • Adequate regulatory measures to implement policy, including incentive programmes and effective legal remedies.

This chapter has outlined the key aspects of the method to be applied. It is now possible to move on to a description of the pressures which shape the state of settlements, thus leading on to a description of the levels of sustainability currently experienced in the variety of settlement types that occur in South Africa.

[1] See for example, **Dasgupta, P.** (1993) *An Inquiry into Well-Being and Destitution.* Oxford: Clarendon Press; **Moser, C.O.N.** (1998) "The Asset Vulnerability Framework: reassessing urban poverty reduction strategies" in *World Development,* 26 (1). UK: Elsevier Science Ltd. Pages 1-19; **Amis, P.** (1995) "Making Sense of Urban Poverty" in *Third World Planning Review*, 7 (1). Liverpool: Liverpool University Press. Pages 145-157; **Department for International Development,** 2000, 'Framework and Introduction', Sustainable Livelihoods Guidance Sheets. http://www.livelihoods.org/info/guidance_sheets-pdf.

[2] IPCC (2001) *Management and Adaptation of Human Settlements*. Taken from http://www.ipcc.ch

[3] **Napier, M.** 2002, "Informal settlement integration, the environment and sustainable livelihoods in sub-Saharan Africa" in proceedings of *Improving Post-Disaster Reconstruction In Developing Countries, Université De Montreal, Montreal, Canada. 23-25 May 2002.*

[4] **Du Plessis, C. and Napier, M.** 2001**.** **"**Introducing sustainable development into the municipal decision-making processes in South Africa – Is a framework possible?" *The Transformation to Sustainable Planning: Decision-making, Models and Tools* .29-31 August 2001, Newcastle upon Tyne, UK. University of Northumbria; **Du Plessis, C. and Duncker, L.**(2000) *Decision-making Framework for Technologies for Enhanced Environmental Management*. Pretoria: CSIR Report No. BOU/c327; **Du Plessis, C**. (2001) *South African Status Quo Report on Decision-making for Urban Sustainability*. Pretoria: CSIR Report No. BOU/I 198.

Chapter 5: The current sustainability of human settlements in South Africa

5.1 Introduction

By looking at the current state of human settlements, one is able to identify the main drivers and pressures that shape our settlements.

The case studies[1] formed part of the evidence collected to determine the state of settlements. However, the diversity within South African settlements makes it impossible to use each case study as a true representation of the state of all similar types of settlements. The case studies are therefore used to provide anecdotal evidence and examples to illustrate what is felt to be a general settlements condition.

This chapter of the report uses the framework identified in Chapter 4 for determining the sustainability of a settlement. It therefore looks at the quality of life provided by South African settlements, the relationship between settlements and the environment, the institutional ability to create and manage sustainable settlements, and the form and structure of South African settlements.

5.2 Quality of life

Service	Basic	Intermediate	High
Water	Communal standpipe within 200m	Yard tank or yard tap	House connection
Sanitation	Ventilated improved pit latrine	Ventilated improved pit latrine or simple waterborne	Full waterborne
Electricity	8 Amp	20 Amp	60 Amp
Roads	Part gravel, part graded	80% graded, 20% gravel	Paved
Storm water	Open, lined where necessary	Lined open channels	Piped underground
Solid waste	Communal removal	Kerbside removal	Kerbside removal

Levels of infrastructure services
Source: Municipal Infrastructure Investment Framework

The *Municipal Infrastructure Investment Framework* (MIIF) prioritises meeting basic needs, and commits government to meeting basic levels by supplying municipal services to all within 10 years (described above). These basic levels of service are meant to improve quality of life by reducing health threats from poor sanitation and waste management, unsafe drinking water and indoor air pollution; as well as improved accessibility and protection from flooding.

The Department of Housing has also announced minimum norms and standards for housing, meant to ensure the provision of adequate shelter. The norms and standards set a minimum size of 30 square metres, as well as specifications regarding permanent structures. These norms and standards are not mandatory in respect of dwellings developed in terms of the Rural Housing Subsidy or the *in situ* upgrading of informal settlements.

However, the quality of life provided by a settlement is determined by far more than the level of infrastructure and services provided. This section looks at South African settlements against a broad range of factors that play a role in determining quality of life.

5.2.1 Health

a) Sanitation

Type of sanitation	1995	1997	1999
Flush/chemical toilet	56.9%	62.1%	55.8%
Pit latrine	29.7%	25.6%	30.3%
Bucket toilet	5.2%	3.7%	3.2%
Other/ none	8.3%	8.5%	10.6%

Changes in access to Sanitation, Oct. 1995- Oct. 1999
Source: Stats SA, 2001[2]

Type of sanitation	Traditional housing	Informal settlement	Formal housing	SA total
Other/ none	46.25%	10%	6.1%	12.4%
Bucket	0.6%	12.5%	2.5%	3.3%
Flush/chem.	1.5%	33.6%	59.7%	48.5%
Pit	51.7%	44%	31.8%	35.8%

Type of facility available in each type of housing, Oct. 1999
Source: Stats SA, 2001

Although there are some discrepancies between the figures used in the above tables, it would appear that there has been a slight decrease in the proportion of households with flush or chemical toilets, and an increase in pit latrines (probably due to the MIIF and the minimum norms and standards set out by the Department of Housing). What is worrying is the increase in households using inadequate systems or having no access to sanitation at all. This probably follows on the increase in the proportion of households living in informal settlements.[3]

Sanitation also has to provide for cultural requirements, for example by providing male and female facilties. Example: Mathabatha
Source: C. du Plessis, CSIR

Households in traditional housing (located mainly in rural areas) are worst off, with 46% having no access to sanitation, or having to use systems below the minimum basic level. Only 1.5% of traditional households have access to flush or chemical toilets, compared with over 33% in informal settlements. There is therefore definite inequality in access to sanitation between rural and urban areas, which directly impacts on the quality of life.

However, higher household densities in informal areas and townships also mean that more people are using the service, thereby increasing the pressure on the service, sometimes leading to local failures in such systems. This in turn poses a greater health risk to poor, higher density urban areas where the absorptive capacity of the environment is less and the affordability of high-level services like waterborne sanitation is questionable. Having access to formal housing is also no guarantee of a basic level of service, as can be testified by the 8.6% of households living in formal housing with inadequate or no sanitation.

Rural sanitation: wattle, can and daub pit latrine, Naledi Village
Source: C. du Plessis, CSIR

b) Clean water

Main source of water	1995	1997	1999
Clean water	78.5%	82.4%	83.4%
Borehole/ rain water	10%	5.4%	4.7%
Stream/dam/well/spring/other	11.4%	12.2%	11.8%

Changes in main source of water for domestic use
Source: Stats SA, 2001

While the number of households with access to clean water has increased, the number that draws water from streams, dams and wells has remained relatively stable, suggesting that improved access to clean water has not significantly affected remote rural households. However, there are some doubts as to the validity of these figures, as many rural water projects appear to be no longer functioning. Several independent studies estimate that between 50% and 90% of water projects implemented between 1995 and 1999 have failed for a variety of reasons.[4] It is claimed that some 70% of rural water supply projects installed during 1996-98 had collapsed within the first year.[5] However, no official figures exist and no comprehensive evaluation has been done to assess the true extent of the problem. Anecdotal evidence about the collapse of these projects (Mathabatha being but one case) raises questions about the effectiveness

of the community participation process and the effectiveness of technology transfer to community water committees.

Rural water supply: Stand pipe in Mathabatha, no longer in use.
Source: C. du Plessis, CSIR

There are as many reasons for the limitations in the success of these projects as there are projects. Reasons range from the difference between community expectations and assumptions about what people are prepared or able to pay for the services, to the quantity of water available for the project, to inefficient training in the maintenance of the infrastructure and a lack of clear delineation of responsibilities between the water committee and the local or provincial government responsible for the project.[6] This leads to constant breakdowns, water contamination, and unrealistic alterations to the project (for instance attempting to provide yard taps instead of the community standpipes for which the infrastructure was designed). Within communities surveyed, there appears to still be limited understanding of the financial implications of different levels of service, leading people to expect the same levels as enjoyed by urban dwellers but for a fraction of the cost. On the other hand, cost recovery measures do not take into account the harsh financial realities and lack of disposable income in rural communities. The basic lifeline service of free water may further complicate cost-recovery systems based on collecting a basic tariff per household for the maintenance of the system (e.g. for buying diesel for the pumps) if the difference between a connection fee and use fee is not clearly explained.

Cost recovery remains low throughout the country, with service arrears rising from 30% to 45% by 1998.[7] This has led to the introduction of prepaid water meters in some areas. Although these projects have shown some initial success, they have also resulted in highly visible disasters such as the cholera outbreak in KwaZulu-Natal, which was partly due to people with prepaid meters being unable to pay even for basic usage and returning to streams as a water source. This problem has now been addressed by the introduction of lifeline tariffs for indigent households and, more recently, the Department of Water Affairs' decision to provide 6 000 litres of free water per household per month. Although the intention is noble, the scheme also has a number of weak points and its success in making at least a subsistence level of water available free to all households still has to be measured.

Not least of these weak points is the fact that this tariff was based on providing a maximum of 25 litres per person per day for a household of six persons. This is at the very low end of the World Health Organisation's recommended daily minimum, and well below the Reconstruction and Development Programme's (RDP's) medium-term service delivery goal of 50 to 60 litres per person per day. The amount does not allow sufficient leeway for larger families and those staying in backyard shacks on the same property, and effectively strangles other survivalist strategies such as urban agriculture. The quality of water being provided has also come into question. Although municipal tap water in South Africa tends to be of high standard, ageing infrastructure, and poor maintenance of communal taps all pose contamination risks. Concerns have also been raised about the proposed fluoridation of drinking water, not only in terms of the health risk posed, but also because of the higher maintenance implications of adding a highly corrosive substance to the municipal water system, as well as its impact on industrial infrastructure using municipal water.

The concerns are serious enough to warrant the Rand Water Board, one of the country's biggest water delivery agents, demanding a government guarantee of indemnity to any legal action that may arise out of damages caused by the enforced fluoridation of the water it supplies.

Urban standpipe presenting a health hazard
Source: A Austin, CSIR

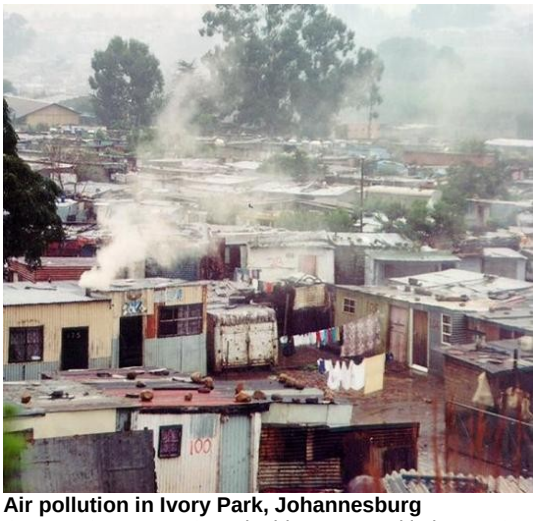
c) Clean air

In South Africa the strongest influence on indoor air quality is the type of energy used for cooking, heating and lighting. The pattern of energy use, associated with other factors such as inadequate ventilation and overcrowding, can result in acute respiratory infection, one of the largest causes of death in the country. It is estimated that 24 million people are exposed to air pollution that can be compared to the London smog of 1952, and the mortality rate for acute respiratory infections is 270 times greater for children in South Africa than those in Western Europe.[8]

Residents/ Safe levels	µg/m^3
WHO	180
EPA	260
White, electrified, winter	320
Black, electrified, summer	390
Black, not electrified, summer	620
Black, electrified, winter	1 150
Black, not electrified, winter	1 250

Average 12-hour exposures to total suspended particulates in Gauteng Industrial Area
Source: Energy Research Institute[9]

From the above table, it is clear that the black population suffers most. However, those living in the more affluent, previously white areas are also exposed to levels far higher than those recommended by the World Health Organisation. For this reason Eskom has launched a massive electrification programme



Air pollution in Ivory Park, Johannesburg
Source: C. Beyers, Sustainable Homes Initiative, IIEC

with some 256 000 electrical connections made in 2000 alone.

Although there are concerns about the pollution and associated health risks caused by the coal-burning power stations, which supply 95% of electricity in the country, preference is still given to supplying grid electricity generated at these central power plants where possible. Renewable technologies are considered only in areas where connection to the main electrical grid would be too expensive.

In South Africa the poor continue to pay a disproportionate amount of their income on energy. While the most affluent 20% of the country spends about 0.1% of its annual household expenditure on energy, those in the lowest income category spend about eight times more than the national average of 0.6% of household expenditure on energy.[10]

In urban areas, most of the energy consumed is in the form of electricity, while in rural areas most household energy is obtained from fuel wood, with the remainder sourced from coal, illuminating paraffin and liquid petroleum gas.

In poor urban areas electrified households tend to limit the use of electricity to save money, using electricity only for lighting and entertainment, while relying on paraffin, wood and coal for cooking and heating. The bulk of electricity supply in these areas is based on pre-paid metering.

Main source of energy for cooking	1995	1997	1999
Electricity	55.4%	54.3%	53%
Paraffin	14%	18.2%	21.1%
Wood	24.1%	20.5%	19.5%
Other (coal, dung, gas)	6.5%	7%	6.4%

Changes in main source of energy used for cooking
Source: Stats SA, 2001

Main source of energy for heating	1995	1997	1999
Electricity	53.8%	54.3%	48%
Paraffin	12.2%	18.2%	13.5%
Wood	25.6%	20.5%	21.9%
Other	8.3%	7%	16.6%

Changes in main source of energy used for heating
Source: Stats SA, 2001

Although 69.8% of households had access to minimum standards of electricity by 1999, compared to 63.5% in 1995, the percentage of households using electricity for heating and cooking has actually reduced, as can be seen from the above tables.

The main obstacles against using electricity for cooking and heating in electrified areas appear to be the cost of electricity, as well as the cost of electrical appliances. Although Eskom has reduced the real price of electricity by over 14% between 1995 and 2000[11], the decrease has had little impact on the affordability of electricity for low-income households, who continue to pay the highest unit cost for electricity.

Attempts to make electricity more affordable is also hampered by the fact that more than 2 000 tariffs apply in the country, and that tariffs are locally determined depending on the supply cost, meaning that urban areas with high consumption pay less per unit than the less profitable rural areas with low consumption, but high installation and maintenance costs, with bulk consumers such as industries paying the lowest unit costs. This often means that the poor ultimately pay more per unit of electricity than the wealthy do.

The Department of Minerals & Energy has been tasked to develop a national electricity basic services support tariff, to facilitate the alleviation of poverty through the provision of basic electricity. It is proposed that all households connected to the national grid be issued with 50kWh/month free of charge, followed by support tariffs. This proposal still has to be approved by Cabinet.[12]

As can be seen from the figures on the use of electricity versus the availability of electricity, simply providing electricity to homes is not going to solve all the problems associated with energy use in low-cost housing. While the availability of electricity certainly improves health conditions [13], it does not necessarily reduce expenditure on energy for the poor.

However, it must be said that household decisions on energy use also have a role to play. Whilst people tend to connect entertainment instruments such as music centres, video machines and television sets to the electrical source, multiple traditional and transitional fuels continue to be used for cooking and space heating. It is unlikely that these patterns of use will change without extensive education programmes on reducing indoor air pollution, similar to the health and hygiene programmes that accompany water and sanitation projects.[14]

d) Absence of disease vectors

The absence of disease vectors such as rodents depends on the effectiveness of a settlement's waste-management system. As the table below indicates, the number of households with weekly waste removal by a local authority has remained relatively stable, while the number of households with no refuse removal has declined.

Method of refuse removal	1995	1997	1999
Local authority	55.4%	55.5%	55.3%
Own refuse dump/other	31%	36.9%	37.7%
No removal	13.6%	7.7%	6.9%

Changes in method of refuse removal
Source: Stats SA, 2001

This means that more households are now using their own refuse dumps to dispose of their waste, or are dumping waste illegally. Uncontrolled dumping of refuse can lead to serious health and air-pollution problems.

Children playing on rubbish dump, Mooiriver
Source: C du Plessis, CSIR

Together sanitation, solid-waste management and access to clean water play a major role in controlling disease. That these factors are not

yet properly in place in South Africa is evidenced by the fact that diarrhoeal diseases are the second biggest cause of death (after injury) for children between one and four years of age.

e) Access to health care

Fewer than 20% of South Africans have some form of private medical cover, therefore the bulk of the population relies on public health care. To help relieve the burden on public hospitals, bring health care closer to the people and encourage preventative health care, national government has implemented a primary health-care programme which includes the building of additional clinics in under-serviced areas and the creation of mobile clinics, as well as free medical care to all children under seven.

While there has been considerable improvement in the number of clinics provided, as well as the service levels within these clinics, there are still problems with regard to access to the water, sanitation, electricity, communication and transport services that are needed to support the efficient functioning of these facilities.

The national availability of electricity at fixed clinics has improved substantially from 65% in 1997 to 92% in 2000. However, it cannot be assumed that electricity supply is always dependable. Interruption of electricity supply is especially problematic in satellite clinics in the more rural provinces such as Limpopo and Mpumalanga.

Case study: Mathabatha Clinic

In Mathabatha, the clinic was running with 50% of its staff complement, and even if it had been fully staffed, the clinic would have been unable to provide the 24-hour service it was supposed to, as there was no after-hours security guard. The head nurse also had to use her personal cell phone in emergencies. Since the visiting doctor's car was hijacked a while ago, no doctor has visited the clinic and staff have not seen the supervisor for months. The nurses have been trained in HIV testing, but no test kits have been made available. Although the clinic is equipped with taps, the local water programme has collapsed, leaving the clinic with little or no water. Source: *February 2002 case study investigation.*

The provision of clean water remains a problem affecting primary health clinics, with 12.5% of clinics dependent on water delivered by a tanker, 5% of clinics obtaining water from a river or dam, and 12.4% relying on rainwater. Furthermore, 20% of clinics have to make use of sanitation facilities other than a flush toilet, and 2% have no toilet facilities. Special sanitary facilities for the disabled are available at only 20.5% of the fixed clinics.[15]

One of the biggest problems faced by rural clinics is the inability to respond efficiently to emergencies that are outside their scope of services. This is because many of these clinics do not have a functioning communications system, nor do they have emergency transport. This gap in communications and mobility also hampers the efficient administration of a clinic.

While more rural clinics have been equipped with telephones, the availability of functional lines has declined, reportedly in some instances due to cut-offs as a result of non-payment.[16] Only 18.9% of clinics have fax machines and only 5.7% of clinics have e-mail. This lack of telephone communications is exacerbated by the lack of any other means of communication such as cell phones, two-way radios or radiophones.

	1998	2000
Urban clinics	90%	72.6%
Rural clinics	51%	54.2%

Availability of functioning fixed-line telephones
Source: SA Health Survey 2000

Clinics are also often short-staffed, as no provision is made for temporary replacements when nursing staff are ill, on leave or attending a training course.

5.2.2 Safety

a) Vulnerability to disasters (natural and man-made)

Some natural disasters are inevitable, but the effects of natural and non-natural disasters can be partially or completely prevented by adequate planning and preparation, early warning and swift decisive responses.

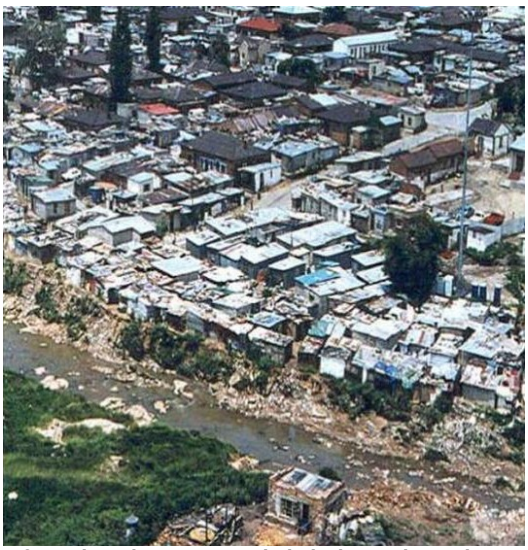
There are two types of disaster:

- *Sudden disasters,* like floods, earthquakes and fires.
- *Slow-onset disasters,* such as drought and famine.

South Africa is particularly prone to disasters such as floods, fires and droughts. Climate-change predictions are also foreseeing more extreme weather events such as high winds and storm surges. The bulk of our built

environment has not been designead to withstand strong winds or extreme weather events of other kinds, making our settlements particularly vulnerable.

It is the urban poor and rural settlements that are most at risk from certain types of disaster. The urban poor, especially those living in informal settlements, are often settled on marginal land such as river banks, steep slopes or areas with high water tables. A further threat to the urban poor is the combination of high densities, temporary building materials, and the extensive use of flammable energy sources (see also Appendix B, section 11).



Informal settlement on Jukskei River, Alexandra
Source: University of Pretoria archives

A full 30% of people still use paraffin or candles for lighting, 47% use paraffin and other flammable fuels for cooking, and 52% use paraffin and other flammable fuels for heating.[17] Burns are responsible for 17% of injury deaths among girls aged between 1 and 4, and for 10% of injury deaths among boys in the same age group.[18] This is especially problematic in informal settlements where the high densities, flammability of construction material, lack of communication technology and weak access to settlements by emergency service vehicles all combine to make these settlements especially high-risk areas for fires.

As was illustrated by the floods in February and March of 2000 and several other disasters, South Africa is still ill equipped to pre-empt, respond to and mitigate disasters. While international focus was concentrated on Mozambique, the north-eastern part of South Africa was repeatedly struck by flash floods. Infrastructure and temporary places of refuge were washed away as soon as they were repaired, as were newly planted crops. Yet Mpumalanga was declared a disaster area only in May, three months after the onset of the disaster. Administrative delays and lack of coordination have resulted in tons of food donations never reaching the intended beneficiaries, with most of the donations eventually being destroyed.[19]

Ill-considered responses to disasters often place a further burden on victims. In the same year (2000) the Jukskei River running through Alexandra burst its banks, leaving hundreds homeless. The aftermath of that disaster has yet to be satisfactorily dealt with. One response was a large-scale forced relocation of people living in Alexandra to Diepsloot, where they have no proper shelter, no services and have to face hostility from the existing community. The schools are not equipped to deal with the extra burden and people cannot afford to pay the transport costs for their children to attend their former schools.[20] The move has also meant that many people lost their social and economic support networks and access to income-generating opportunities. Similar problems of bureaucratic inefficiency and lack of planning were experienced by the victims of a tornado in Manenberg, Cape Town.[21]

A further safety threat can be found in the badly regulated industrial sector. Self-regulation of industries, inefficient inspection of industrial sites and ineffective punishment for transgressors place nearby settlements at increased risk of industrial disasters.

b) A secure living environment

South Africa experienced a dramatic increase in crime after the transition to a democratic government in 1994 (See Appendix B, section 3, for further discussion). Although the crime rates stabilised during the first three years after the transition, crime rates escalated by 4,8% between 1997 and 98, and 7% in 1998-1999. Not all crimes increased or decreased at the same rate. The greatest increase, of 121%, was in common robbery, while residential burglary, assault with the intent to commit grievous bodily harm, rape and car hijacking all increased by over 20% between 1994 and 1999. While the number of murders has decreased, recorded violent crimes (murder, attempted murder, rape, and all forms or robbery and assault) have increased consistently since 1994. In 1999, a third of all

crimes recorded by the police in South Africa were of a violent nature.[22]

If one uses the Interpol figures for 1998 to compare South Africa with many other countries in the world, the country has high but manageable levels of property crime, but an extraordinarily high level of violent crime.[23]

Crime is also unequally distributed in different geographical areas (in terms of provinces, cities and within cities), and in terms of different social groups in the country. For example, in 1999 the recorded number of murders was the highest in the Western Cape (81), followed by KwaZulu-Natal (70) and Gauteng (69).[24] However, the recorded crime figures for 1999 show that Johannesburg had by far the highest crime rate (violent and property), with Pretoria coming in second.[25]

In South Africa, townships and poorer areas experience the highest per capita levels of violent crime in cities. A victim survey conducted in 1997 indicated that individuals in poorer households experienced the highest levels of violent crime and that individuals living in the wealthiest households were the least likely to be victims of violent crimes. These figures also confirm the view that the growth of violence is to a significant extent concentrated in urban and metropolitan areas, as well as in particular areas within cities.[26]

Between July 1995 and April 2000 the number of SAPS employees decreased by 14%. This figure includes uniformed police officers, detectives and civilians. In July 1999, 70% of SAPS employees were uniformed policemen, 14% were detectives and 16% were civilians. During the same period, there was one uniformed policeman or detective for every 408 people in South Africa. This compares favourably with other developing countries (e.g. Namibia 492:1 and Swaziland 665:1), but is relatively low compared to some developed countries (Germany 315:1; Portugal 225:1 and Italy 102:1) .[27]

There is still a general perception in South Africa that the police are ineffective in the maintenance of law and order, or do not provide sufficient services. A recent survey indicated that nearly half of 13 659 respondents believed that the quality of policing in their areas had deteriorated in the last four years. A third believed that there was no change at all, despite the fact that crime levels had increased. In addition, there are high levels of distrust of the police. These perceptions, however, varied between different groups within the general population. Those who had never dealt with the police tended to have very negative perceptions of the police, whereas those who had dealt directly with the police generally tended to have much more positive perceptions.[28]

South Africa's criminal justice system is not performing optimally. In 1999, some 2,4 million crimes were recorded by the police and 200 000 crimes ended in conviction of the perpetrators. While it is true that not all recorded crimes should necessarily result in a conviction, the number of convictions in South Africa is low. On average, fewer than 9% of recorded crimes result in the conviction of the perpetrators. For some serious crimes, the number of convictions as a proportion of recorded cases is even lower. In 1999, the number was 2% for car hijacking, 3% for aggravated robbery, and 8% for rape.[29]

The proliferation of firearms is another significant contributor to high crime rates. South Africa is a heavily armed society. The police's central firearms registry indicates that 3,5 million South Africans legally possess some 4,2 million firearms, of which slightly more than half are handguns. It is estimated that a similar number of illegal firearms are circulating in South Africa. In addition, South Africa's porous borders allow arms smugglers to bring large quantities of firearms into the country. Because of an oversupply of small arms in the region these sell cheaply, making them accessible to petty criminals and juveniles in South Africa, who frequently use them to commit crimes or resolve personal disputes.[30]

The apartheid city and its specific spatial manifestation enhance opportunities for crime in urban areas. The following spatial characteristics play a strong role: the spatial dislocation of the poor on the peripheries of the cities and the ever-increasing low-density suburban sprawl, both of which result in long and costly commuting patterns; the separation of communities through rapid transport routes, large buffer-strips and undeveloped open land; the rigid mono-functional zoning of land with often inappropriate, enforced land uses that leave some areas deserted during the day or night; the degraded and poorly developed built environments experienced by many in the South African city; and the effective exclusion of many city residents from the amenities and economic opportunities offered by the city due to the location or absence of these facilities.[31]

Citizens respond to the threat of crime in different ways, ranging from community approaches to interventions in the physical environment, through to defensive architecture and urbanism, which lead to extensive urban fortification and spatial transformation. Examples range from simple burglar bars, alarms and fencing to security villages and the closure of existing roads to form enclosed neighbourhoods.

The private security industry has also shown tremendous growth, especially in Gauteng, where 54% of private security officers are located. By 2000, private security officers outnumbered uniformed police by two to one.[32]

However, most of the above responses are only available to the affluent members of society. In poorer communities the response has to be community-based, and while there are a number of community crime-prevention initiatives that work closely with the local authority and police, the number of vigilante groups has also rapidly increased in South Africa.

On balance, South Africa does not offer a very secure living environment, and many of the community responses to the high crime levels are creating future problems, such as increased social exclusion and a culture of taking the law into their own hands. The legacy of the particular spatial form of the apartheid city and its contribution to crime will be particularly difficult to overcome. The past few years has also seen the creation of what amounts to a private army with more manpower than the combined uniformed membership of the South African Police Service and Defence Force.

Private security officers (March 2000)	216 000[33]
All SAPS officers (Nov. 2000)	102 300[34]
Defence Force members incl. non-combatants (March 2001)	78 800[35]

Number of officers in private and public safety and security
Source: Various

Together, these trends can pose a serious threat to future internal stability, as is already evident in countries such as Brazil. In that country, radical responses to crime contributed to higher levels of inequality, fear, suspicion, and a feeling of vulnerability, which in turn have led to power struggles over territories and the use of various methods of control, many of which are illegal and a violation of human rights and citizenship.[36] This poses many concerns for a sustainable democracy and related urban development.

5.2.3 Shelter

a) Adequate, affordable housing

Housing is a right embodied in the Constitution (Section 26), which states that every citizen of the country has a right to access to adequate housing. The right to own and inherit property is also embedded in the Constitution. It is estimated that there were 9,05 million households in 1997. Gauteng had the most 22%), despite the fact that the greatest number of people lived in KwaZulu-Natal. This can be explained by the household densities for the two provinces. In Gauteng the average number of people per household is 3,6, while the average for KwaZulu-Natal is five per dwelling[37] If one takes the minimum requirement specified in the Housing Act, 30m^2 for a house, it translates to a floor area of 6m^2 for those dwellers in KwaZulu-Natal and a floor area of 8,3m^2 for those in Gauteng.

If one considers the changes in types of housing, interesting patterns and fluctuations emerge. While the proportion of formal dwellings has generally increased, the proportion of informal dwellings has also increased. This could partly be due to increased urbanisation, as well as a change in the demographic profile, leading to higher levels of new household formation.

Housing type	1995	1997	1999
Formal	65.8%	70.9%	69.9%
Informal	7.5%	11.3%	12.3%
Traditional	15.3%	13.6%	10.9%
Other	11.4%	4.3%	6.5%

Changes in type of housing, Oct. 1995 – Oct. 1999
Source: Stats SA, October Household Survey 1999

Apart from the distribution of dwelling types overall, differences are apparent between urban and rural areas. Whereas urban areas have considerably higher percentages of formal and informal houses, as expected rural areas have a much higher proportion of traditional dwelling types.

	Formal	Traditional	Informal	Other
Urban	74.7%	1%	16.6%	7.8%
Rural	63.3%	26.2%	6%	4.5%

Type of housing in urban and non-urban households
Source: Stats SA, October Household Survey 1999

This may be in part explained by the differences in household income in urban and rural areas. Eight percent of urban households earn less than R500 a month, compared to 29% of households in non-urban areas. In

contrast, 34% of urban households earn over R4 000 per month, compared to only 8% of households in non-urban areas.[38]

Household income also has a significant impact on household expenditure. A large proportion of the average household income is spent on essential products and services like food and housing. Households spend an average of 59% of their annual expenditure on four items:

- Food: 18%
- Housing: 16%
- Income tax: 15%
- Transport: 10% [39]

The poorest households, however, spend almost 75% of their total annual disposable income on food and energy. This leaves them with very little to spend on housing.[40]

Since 1994 there have been considerable efforts to improve the quality of life of many, through assistance to acquire adequate and affordable housing. In February 2001 the housing minister announced that, between 1994 and December 2000, 1 129 612 houses had been delivered and 370 000 title deeds were transferred to people who had previously rented council houses in townships. A further 350 000 council houses were to be transferred during 2001. The result is that between 4,5 and 5 million people have been given "secure tenure" homes in South Africa between 1994 and February 2001. Compared to countries such as Cuba, Singapore and Sweden (used as benchmarks throughout the world) South Africa has delivered an astonishing number of houses within a short time.[41]

Example: Thuli Nhlapo
In 2000, the National Command Centre granted R91 million to the Mpumulanga Department of Housing for emergency flood relief. About R30 million was allocated for the construction of 4032 houses in the province. Unfortunately, most of the 15m^2 one-roomed houses built for the flood victims have collapsed. Builders blamed it on the cheap and poor quality building materials that were provided to them.

The scale of delivery is very impressive, as is evident in the above-mentioned numbers. Another positive sign is that housing delivery has increased from year to year since 1994: in the first two years only 25 000 housing opportunities were created, increasing to 200 000 per annum after that and peaking at around 300 000 in 1998.[42]

However, there are some concerns about the quality of housing that has been delivered over the past five years, particularly in terms of size of units and the quality of the public realm. The development of norms and standards, as well as the establishment of consumer-protection bodies such as the National Home Builders Registration Council, are beginning to have an impact on the improvement of the quality of housing in South Africa. Space standards and construction standards are also likely to improve with time.[43]

Subsidy housing, Mooiriver – one year after construction
Source: C du Plessis, CSIR

Nevertheless, reports about subsidy houses being built without foundations or floors, and houses collapsing in storms or cracking apart within a few months, grew as the housing subsidy could buy less and less, and contractors cut corners in order to make a meagre profit. It is hoped the recent adjustment of the housing subsidy will improve the quality. Yet, other concerns remain.

The first is the somewhat ad hoc planning involved, right down to situations where houses are being supplied with flush toilet pedestals when water is supplied through a communal tap. By the time there is funding available for upgrading to waterborne sanitation, the initial investment in that pedestal would be completely destroyed. While incidents like this and those described in the previous paragraph are isolated, they are symptomatic of a crisis-management approach and have given a bad image to subsidy housing, which in turn impacts on the perceived value of these houses and their usefulness as collateral.

The other, graver, concern is about the quality of settlements that are being created and their

performance over time. With the emphasis on fast-track development of large quantities of very cheap housing, the national housing programme has provided a tremendous number of shelters, the rationale being that homeowners would then upgrade these over time. However, given the quality of some of this housing, and the reluctance of financial organisations to accept these houses as collateral for further financing, it is debatable whether this aim will be achieved everywhere. The lack of social amenities and peripheral location of many of these settlements, and the fact that the subsidy scheme tends to group the poorest of the poor together, also inhibits the formation of fully functional settlements. The concern is that, in the future, government will need to continue to support such settlements through costly upgrading and continued transport subsidies, rather than more self-sustaining settlements developing and driven by a vibrant local economy. community with community sustainable settlements.

Buffalo Flats, Duncan Village, East London
Source: C. du Plessis, CSIR

Another concern relates to the lack of design input into the houses and the settlement layout. Densities of houses are generally low, although huge discrepancies exist in some cases between gross layout densities and occupational densities. As areas consolidate, higher population densities do reach thresholds which make local economic development more viable. However, there is little experimentation with new house forms or different housing typologies, as well as alternative building methods. An exception is Buffalo Flats in East London.

Although the Buffalo Flats project managed to create suitable conditions for densification, it is often very difficult to densify, and densification is not appropriate in some conditions.

Case Study: Buffalo Flats in Duncan Village, East London

The project in Buffalo Flats started to make use of different types of housing (single houses, semi-detached houses and two-storey walk-ups) in one project area, to offer a variety of choices to the future residents, breaking the cycle of creating homogeneous, low-income areas and instead creating more efficient settlements. This will also contribute to efforts of densification in an appropriate way. A number of tenure options (RDP, rental and credit-linked housing) is also planned, but problems are being experienced in this regard, since the subsidy scheme generally does not make provision for a combination of tenure options (and accompanying subsidy types) in one project.

The project also makes use of alternative and environmentally friendly building methods. Both RDP and credit-linked houses were built of locally produced compressed earth blocks. This left additional funds for facia boards to protect exposed timber beams. No corrugated iron or asbestos roofs were used in the construction

The project also placed a lot of emphasis on the urban design of the area, making use of the “woonerf” concept to create more intimate spaces and the principle of mixed use, incorporating an old-age facility, space for urban agriculture, a bakery and shops, as well as public open spaces in the design.

While the guiding plans for the Greater Pretoria Metropolitan Council advocate a sustainable city with higher densities, by-laws contradict this vision. Owners of single residential properties are awarded a 40% tax rebate, which they forfeit when rezoning to higher densities. In addition, while densification is appropriate in some areas, it may actually be counter-productive in others. A survey of densest housing areas in Mamelodi revealed that 80% of all lots had backyard units and that there was an average of two additional units

per plot, with a maximum of six. Evidence has also been presented of up to 40 people per lot. Reducing lots could therefore increase the problem of overcrowding and not address the real problem which is not the size of the lot, but the number of people per plot, leading to high demands on services and facility standards.

Example: Greater Pretoria Metropolitan Council
A study carried out by Senior showed a clear discrepancy between gross layout density (du/ha) and occupational density (p/ha). In three different areas developed as single, detached single-family housing, with a floor area ratio of between 0,1 and 0,15, the number of persons per hectare varied from 18 to 120. In two other areas the population density was 700 and 690 persons per hectare respectively, while the floor area ratios were 3,97 and 0,24.

For many the affordability of formal housing still remains a problem. Considering the implications for people in the income bracket of R1 000–R2 600, and taking the cost of a house (estimated purchase price) in August 2001, they would need a deposit of R16 036, with average monthly repayments of R1 718. This far exceeds the savings of most people in this income bracket, even after two years, as a study by the NHFC showed, where the affordable deposit for such a house is actually R8 576 (15%) and affordable monthly repayments R700.[44]

The housing subsidy has recently been increased, with a provision for annual inflation adjustments. Subsidies for the below R1 500/ month income bracket will also be subject to a minimum own contribution of R2 479. However, single women with dependents, as well as the aged and disabled who fall below the R800/month income limit, will receive a subsidy of R22 800, with no compulsory contribution. A Southern Cape Condensation Belt allowance of ± R1 400 is also applicable. Provision has also been made for an institutional subsidy of R27 000 for medium-density housing. The higher amount is to allow for the increased costs of providing a higher level of service (especially waterborne sanitation) and other extras, such as staircases.

Income (R/month)	Subsidy	Own contribution (R)
R 0 – 1 500	R 20 300	R 2 479
R 1 501 – 2 500	R 12 700	Balance of purchase price
R 2 501 – 3 500	R 7 000	Balance of purchase price

Revised subsidy arrangements from 1 April 2002
Source: Department of Housing

b) Special needs housing and care

In the October Household Survey (1995), the CSS reported a disability prevalence of approximately 5% of the people in South Africa. Research, however, estimates that between 5 and 12% are moderately or severely disabled.[45] These figures are based on the 1996 census and exclude people living in institutions. For the purpose of analysis, it would therefore be reasonable to use 12% as a more representative (even conservative) figure of the estimated proportion of people with disabilities in South Africa. This excludes people who are temporarily disabled and recovering from injuries, as well as the old and frail.

Disability	
Sight	41%
Hearing	15%
Physical (including wheelchair users and people with dexterity impairments)	21%
Mental (mental illness and learning disability)	7%
More than one disability	6%
Unspecified	10%

Percentage of people identified as experiencing certain types of disabilities
Source: 1996 Population Census

The Housing Subsidy provides an extra grant for disability access and fixtures to aid the disabled, while universal access to public buildings is a requirement in the National Building Regulations.

Other special-needs housing includes housing for the aged and for orphans. There are a number of facilities in the country that provide special needs housing. In the middle- to upper-income bracket there is adequate provision for the elderly and a boom in so-called “retirement villages”, which combine a measure of independence with professional care. However, the poor have little access to such facilities and remain the responsibility of their families, who often rely on their old age pension to make ends meet.

Facilities (January 1997)	Number
Children's homes	182
Places of safety	100
Homes for the disabled	111
Homes for the aged	721
Housing schemes for the aged	375
Service centres for the aged	373

Number of public and private welfare housing facilities
Source: South African Institute of Race Relations [46]

Welfare policy promotes a shift to developmental social welfare, which emphasises helping people to help themselves and thereby becoming self-reliant. This has seen a shift in spending away from welfare agencies to the provision of social grants. The Integrated National Disability Strategy seeks to ensure that disabled people are enabled to develop optimally, are not removed from their communities, and that ways of meeting their needs are developed with their communities. In practice this meant that funding to agencies providing special-needs housing and care facilities has been drastically reduced, placing many people in the care of families that are not adequately equipped and often not financially able to care for them. The situation will become increasingly worse as Aids decimates the economically active population which often performs the function of care-givers (see also Appendix B, section 4).

A critical problem is the provision of care facilities and housing for the increasing number of orphans. By 2005 there are expected to be around 800 000 Aids orphans under the age of 15, rising to 1,95 million in 2010. A 1992 survey indicated that 62% of Sowetans felt that care for Aids orphans was the government's responsibility.[47] It has been found that Aids orphans are being ostracised by their communities and exploited financially by relatives who have taken them in, primarily to receive a state grant.[48] Those community members who have taken it upon themselves to care for orphans and rejected children, are themselves often reliant on disability grants or old-age pensions, and do not have the resources to provide adequate levels of care.

Orphans are also vulnerable to physical and sexual abuse, or may be forced to turn to crime and prostitution as a survival strategy. Studies on the common factors leading to delinquency and violent criminal activity in youth identified several factors currently experienced by Aids orphans in the country, such as poverty, social exclusion, dysfunctional family structures, degradation of social bonds, the presence of facilitators such as drugs and firearms, and social valuation of a culture of violence. It is highly likely that without adequate care for Aids orphans, the country will experience a significant increase in violent interpersonal crime, and violent crime against property, such as malicious injury to property.[49]

5.2.4 Productive life

a) Access to formal employment

The October Household Survey of 1999 estimated the expanded unemployment rate for South Africa at 36;2%. More recent but unconfirmed studies are placing it at close to 45%. This is mainly because the number of employment opportunities created is not keeping up with the demand for work as increasing numbers of young people enter the job market.[50]

Unemployment rate	%* Urban male	%* Urban female	%* Non-urban male	%* Non-urban female	%* Total male	%* Total female	%* Total
Official unemployment rate	18.4	25.8	22.7	32.3	19.8	27.8	23.3
Expanded unemployment rate	26.2	37.9	37.4	52.7	30.0	43.2	36.2

Official and expanded unemployment rates amongst males and females living in urban and non-urban areas.
Source: Stats SA, October Household Survey, 1999
* As percentage of all people in that group

The highest unemployment rate is for African females living in rural areas, while it is lowest among white men in urban areas. In general, the employment rate is lower in rural areas than in urban areas. Unemployment is also highest amongst those between 15 and 24 years (both official and expanded). This percentage gradually decreases to 5,8% among the economically active aged 60-65 years.[51]

The lowest unemployment rate, using the official definition, is found among those with a tertiary education (8,5%), followed by those with no formal education (16,5%). The highest unemployment rate is amongst those with at least some education up to matriculation. This must be balanced against the fact that many of those with no formal education, as well as those with a tertiary education, tend to fall into the older age brackets where unemployment is considerably lower.[52]

While 20,8% of the employed living in urban areas were in elementary occupations, this figure is 39,5% for non-urban areas. Rural

areas also employ more skilled agricultural workers. Urban areas, on the other hand, have a higher proportion of those in high-level occupations and more opportunities for clerical work. More than a quarter of all workers (26,4%) are in elementary occupations such as domestic work or planting on a commercial farm. Only 5,4% are in professional occupations, and 6,7% in managerial positions.[53]

While the laws that fostered large-scale migrant work no longer exist, other factors still result in significant numbers of people living apart from their families in order to earn an income. The percentage of migrant workers is highest for men between the ages of 40 and 54. This is the age group whose work patterns were established during the apartheid years, and who invested their earnings in rural homes.[54]

About 19 million South Africans are living below the poverty line. An estimated 72% of the population considered poor is living in rural areas.[55] However, this figure is estimated on income levels and does not include the natural capital available to the rural poor that provides them with resources unavailable to the urban poor. The picture is further complicated by the fact that the majority of the economically active population can be found in urban areas, while the rural areas are mainly populated by the young (below 19 years) and the old (65 plus).See Appendix B, section 6, for further discussion.

Rural areas may have higher percentages of unemployment, but the difference between income and what is needed to survive (the poverty gap), is higher in urban areas. This further complicates the spatial distribution of people and income and migration patterns. For example, a substantial number of people living in Duncan Village, outside East London, also have formal homes in nearby Mdantsane. This is a result of high transportation costs prohibiting daily commuting to perceived economic opportunities, while the higher living costs in the formal housing areas close to East London prohibit people settling there permanently.

The high costs of urban living, combined with the low value of rural and peri-urban assets established during the apartheid years, is also keeping people in areas like the Winterveld, near Pretoria, where there is little economic opportunity.[56]

b) Access to education

While it would appear that there is an adequate number of schools in South Africa (27 148), their spatial distribution, facilities available, and operational functionality are less than desirable. This situation is amply illustrated by the situation in the Eastern Cape.

The Eastern Cape, with the third largest population, has the largest share of schools (23,1%) and reported the largest increase in number of educators employed. The province has also reported the highest decline in the number of learners per classroom, with the lowest learner/classroom ratio in the country.[57] Despite these improvements, primary schools in East London were forced to turn away hundreds of learners who wanted to enrol at the beginning of 2002, with some schools already forced to accommodate more than double the number of learners they were designed for.[58]

As the Auditor General's 2001 report on the State of South African Schools shows, three-quarters of the schools in the Eastern Cape were without electricity, while a third were without water. A total of 206 schools in the Province were declared "unfit for education". Thousands of teachers in the province were also found to be without an appropriate qualification. This includes a total of 3 527 principals who did not have a minimum three-year qualification.

Minister of Education Kader Asmal recently disclosed to government that two-thirds of South African schools are without adequate sanitation (set as one toilet for every 30 learners), and 11,7% of schools have no sanitation facilities at all[59], leaving 1,9 million learners with no toilets.[60] Where schools do have toilet facilities, the 2000 School Register of Needs Report found that 15% of toilets were not working, most of which were in rural areas. Despite a drop in the number of schools with no access to water, 28,8% of schools still do not have an adequate water supply.[61]

Schools are also unable to fully join the information revolution, as 35,5% of schools still have no access to telecommunications of any form, and 70% are without access to computers for any purpose. However, the numbers of computers available for teaching and learning has quadrupled since 1996.[62]

While progress has been made to improve the operational efficiency of schools, problems with delivering schoolbooks and teaching

equipment, an uneven distribution of staff, absenteeism and lack of skills amongst staff continue to hamper the proper functioning of schools.

Although school attendance in the country is relatively high, South African children seem to progress through school rather slowly. The 1999 October Household Survey showed that a quarter of children aged 16 have not completed primary education and that 10,4% of people aged 24 were still at school. This places an additional burden on the education infrastructure.

Rural school, Mathabatha
Source: C. du Plessis, CSIR

Formal education in South Africa is presently reaching the vast majority of children between the ages of 7 and 15, as more than 94% of children in this age category attends school. Opportunities for people to achieve a secondary education are also steadily increasing. However, actual educational achievement among school-goers (as well as adults) tends to be rather low. Children seem to be struggling to complete both primary and secondary school and relatively few people attend tertiary educational institutions.[63]

There are also 390 Education for Learners with Special Education Needs (ELSEN) Schools in the country. These schools are far better equipped, overall, than ordinary schools, with much better access to water, sanitation and electricity and a learner/computer ratio of 19:1. However, only 33% of ELSEN schools have access ramps for the physically disabled.[64]

c) Access to housing finance

Despite a number of role-players active in the provision of housing, it is ultimately the government's responsibility to ensure that the goal of adequate housing for all is achieved. To this effect, government has instituted the subsidy scheme to assist people earning less than R3 500, and more particularly the lowest income bracket earning less than R1 200 per month, who are entitled to R16 000 per household, broadly resulting in a house of more or less R24m^2 (or bigger, depending on the availability of extra funds or the type of materials used) and subtracting land development costs of R7 500.[65]

A household earning R1 000 to R1 200 should be able to borrow approximately R8 000 and top up the subsidy to result in a house double the size of that of the previous group. Above R3 500 the subsidy falls away, but a person is still able to acquire a house of between 40m^2 and 60m^2 at monthly bond repayments varying from R1 300 to R2 300 per month.[66]

A problem, however, has been that until recently the subsidy per lower income bracket had remained basically the same since the inception of the housing subsidy scheme, but inflation had increased significantly, thus reducing the buying power of the subsidy. By 2001 is had become impossible to afford the size and quality of house built in 1996.[67] This has been addressed by a recent increase in the subsidy amount, although there are still some doubts as to whether this amount is sufficient to cover the 28% escalation in costs in the past year. The NHFC recommended the refinement of the subsidy policy, and debates regarding this are currently in progress.

Financial institutions have also been required to improve their mobilisation of funds' strategies to take responsibility for the lower-end of the market through large-scale funding.[68] Commercial banks have become more involved in the low-cost housing sector, with close to 300 000 mortgage-based loans worth R4 billion being granted to people living in formal townships. In addition, half a million microloans have been made to the value of R3 billion.[69]

One of the basic aims behind the housing subsidy was to provide people with an asset that could be used to access economic opportunities. This has happened in many cases where access to adequate, serviced housing with secure tenure placed previously disadvantaged families in strong positions to become more active participants in the economy (both formal and informal), through, for example, home-based enterprises or sub-letting.[70]

However, for the poor these houses may present an extra economic burden, as they now have access to services, but still no

money to pay for the services. Recently, in Delft in Cape Town and Hermanus in the Western Cape, a number of people have been evicted from their homes because they are unable to pay for services – not only losing their shelter, but also the asset that was supposed to give them entry into the economy.

These examples also have illustrated the poorly perceived value of this asset, with municipalities repossessing homes for debts of as little as R500. Many people in this situation are selling their subsidy homes for small amounts to raise funds for a funeral or a child's education, or simply because they cannot afford to live in these houses. The market has set the value of a subsidy house as lower than its capital cost. These houses thus have little value as collateral for loans to start a small business. The lack of a secondary market in low-income housing can partly be explained by a historical lack of exposure to home ownership.

Evidence has also shown that for nearly all residents in informal settlements, the "use value" characteristics of their investments in the top structure far outweigh any "exchange-value" considerations.[71]

d) Mobility

South Africa's transport system is overwhelmingly motor vehicle based, yet only 100 people out of every 1 000 owns a car (compared to figures of 413 for Sweden and 489 for the USA). However, this figure is considerably higher than that found in other African countries like Nigeria (7 cars/1 000 people) and Mozambique (1 car per 1 000 people).[72]

South Africa's spatial distribution of settlements and opportunities within those settlements make an efficient, affordable public transport system both indispensable and expensive. While more than 60% of the "ultra-poor" walk to work[73], the prohibitive distances between their areas of residence and employment opportunities severely limit their economic opportunities and cause them to spend a considerable amount of time commuting.

The Department of Transport heavily subsidises the bus and train services, but obviously not the private minibus taxi service, which is the most available mode of transport to the majority of the poor. Therefore current government transport subsidies are not benefiting the poorest of the poor.[74] Operating on low profit margins, the taxi industry has become notorious for its unroadworthy vehicles, impatient drivers and fierce, often violent, competition. Attempts are being made to upgrade and formalise the taxi industry to provide a safer, more reliable service.

While South Africa has an extensive rail infrastructure, several factors are contributing to its unpopularity as a mass transit system.

The most important factor is that the main commuter lines tend not to follow the spatial logic of the settlement form, resulting in stations with no access to a secondary hierarchy of transport. This often means that commuters are stranded on the edges of suburbs far from the major bus or taxi ranks that will take them to their final destination. This is not only inconvenient, but also dangerous. The rail link between East London and Mdantsane is a good example, with suburban stations located on the edge of the town and surrounded by vacant land.

Station, Mdantsane
Source: K. Landman, CSIR

Metrorail has begun to address this situation in several of the large cities by introducing the concept of modal interchanges. These provide a link between different modes of transport, while providing an extended hours commercial node to improve commuter safety. The success of more ambitious commuter train systems, such as the Gautrain between Johannesburg and Pretoria, will to a large extent depend on their successful linkage to a finer hierarchy of public transport and the perceived safety of commuters, both on the train and at the stations.

As road transport is the dominant mode in South Africa, the maintenance and expansion of our road network is vital for a functional economy. At present more than half the country's road network has exceeded its 20-year design life span, and many secondary roads are seriously deteriorating.

Commercialisation of roads may resolve the funding crisis in urban areas and on major national routes, but is unlikely to benefit the poor, especially those in rural areas.[75] In fact, it may even further marginalise these areas.

5.2.5 Access to information

a) Communications technology

To be able to participate in decisions that affect one's quality of life, the first requirement is the ability to communicate. In the twenty-first century, this means access to public information and discourse through a free press and range of media such as newspapers, radio stations and television, as well as access to telecommunications systems.

South Africa has 362 radio stations broadcasting on AM, FM and shortwave to almost 14 million radios (1997 figures) throughout the country. Apart from four free-to-air television channels, another 50 pay channels are available through digital satellite technology. There is one television set for every seven people in the country (1997 figures). Most of the larger towns and all the major cities have their own local newspaper. There are also a number of national daily and weekly newspapers and an extensive range of magazines catering to all sectors of society. [76] The country also has 150 Internet Service Providers offering their services to 1,82 million Internet users (2000 figures).[77]

South Africa offers both fixed-line and mobile cellular telephone technology. In 1999 34,9% of households had a telephone (cellular or fixed) in the dwelling, as opposed to 29,1% in 1995. However, the distribution is uneven, with 51% of households in urban areas having a telephone in the dwelling, compared to 10,2% in rural areas. Altogether, South Africa had almost six million fixed telephones and over two million cellular phones in 1999. The percentage of people with access to cellular phones is said to have changed considerably since 1999 with the introduction of pay-as-you-go technology and a third cellular service provider. This makes South Africa's telecommunications the most sophisticated in Africa. However, telecommunications in rural areas are still inadequate, with 59% of people in rural areas further than 16 minutes from the closest telephone.

As with most other infrastructure options, telecommunications are proving to be unaffordable for many. The high monthly rental costs, combined with a recent increase in local call tariffs are placing fixed lines out of the price range of the majority. In the year to March 2001, Telkom provided 620 000 new connections while 220 000 lines were terminated. However, the all-inclusive pre-paid cellular system is proving to be popular. Although it is more expensive to use than fixed lines, it allows people to control their costs more effectively and does not place them under any monthly obligation. They can therefore adjust their telephone usage according to their income, while remaining accessible to friends and family for a small fee.

b) Access to planning and policy information

Access to useful information is the second key component to self-determination. This includes information about planned development in the area, and information regarding changing government policy. This should be information of sufficient depth to enable the citizen to make an informed decision or effectively participate in public participation processes.

National government policy and legislation is available on the Internet for those with access to it, and some of the metropolitan areas and larger towns have information regarding their state of the environment and Integrated Development Planning (IDP) process available on the Web. However, in most municipalities accessing something as basic as an IDP and the information on which it is based remains a daunting task, even for experienced researchers. The quality and currency of the information available is also dubious in many cases

The new municipal demarcation, which combines several local authorities into one municipal area, is making it even more difficult for the poor to access basic information about municipal services. In cases like the Dihlabeng and Phumelela municipalities, accessing basic municipal information like an enquiry about your water bill can mean an expensive journey to a town 50 or 60km away.

c) Democracy and self determination

In South Africa, the main vehicle through which communities can participate in the creation of their settlements is the Integrated Development Planning (IDP) process. The IDP process emphasises participatory municipal planning and building partnerships between local government and the community to reach common developmental goals. In theory, the IDP should enable local authorities to plan according to local needs, thereby providing more appropriate development, which in turn

will lead to more efficient use of resources. However, the IDP participatory process has been roundly criticised – firstly, for not considering the rationale from the perspective of the "recipient" of development; secondly, for not taking into account the plural nature of the parties who have a stake in development;[78] and thirdly for failing to recognise power imbalances in the community and how these can influence so-called consensus decisions.

It is also suggested that the participatory components of IDPs were introduced to put into practice a rationale which sees development as a process in which communities remain a recipient of resources where the allocation of resources occurs from above; and that municipal budgets and projects are, to a large extent, pre-determined by factors beyond the influence of local authorities. These factors pertain to the macro-economic context and institutional framework of governance in South Africa, as well as societal factors.[79]

While participation at a broader scale is difficult, it has been shown to be successful at a project scale. Here the People's Housing Process is an excellent example of how participation by the beneficiary community in the creation of their housing can provide a better quality product.

House built through the People's Housing Process, Victoria Mxenge, Cape Town
Source: S. Liebermann, CSIR

5.2.6 Quality of the built environment

a) Natural heritage

South Africa has been blessed with a rich natural heritage and most cities are fortunate in that some of this heritage has been preserved within urban boundaries, thus providing urban dwellers with access to open green spaces. In the past local authorities and homeowners have also contributed much to urban greening, turning the older part of our cities into woodland and, in the case of Johannesburg, into what is held to be the largest man-made forest on the planet.

Sadly, much of this heritage is coming under pressure. In wealthier areas, open space is coming under pressure from developers, while informal settlement and its impacts such as pollution and deforestation are threatening the open space system in poor areas and on the urban fringe. Badly planned and managed open space systems have also acquired a reputation as havens for criminals, with many citizens feeling that it is not safe to visit and enjoy these areas. However, the importance of open-space systems and their environmental value to settlements are beginning to be appreciated. Durban has even quantified the value of its open-space system to the city, and most of the other large cities are busy, or at least contemplating, the development of Metropolitan Open Space System (MOSS) management plans.

Another legacy of apartheid is the uneven distribution of open green space. Neighbourhood parks were developed in areas where most houses had large gardens of their own and people therefore did not use the parks. In contrast there were few well-developed parks in township areas, and even fewer greening programmes.

b) Urban decay

Urban decay in South Africa results from a number of factors. These include a lack of maintenance, overcrowding, crime, and eventually the movement of businesses from the inner core of settlements. The latter is even happening in towns like Bethlehem. The growing number of enclosed neighbourhoods is also increasingly hampering regular urban service maintenance.

Much of the infrastructure in South Africa is also ageing. Leaking water pipes not only waste precious water (see also 5.3.1 (a)) but, in areas prone to the formation of sinkholes, can damage roads and pose a serious danger to citizens.

In the townships, South Africa inherited an already sub-standard urban environment subject to severe degrading. Eroded roads, vacant land set aside for social and business facilities that never materialised, and the high incidences of informal settlements and backyard shacks all contribute to a deteriorating urban environment. The minimum standards for infrastructure in these areas further contribute to the high levels of decay.

Eroded township street
Source: A. Austin. CSIR

There are several initiatives under way to resolve the issue of urban decay. The most prominent of these is the Urban Renewal Programme. Urban greening programmes, linked to food security, are also playing a large part in improving the situation in the townships, while community waste management (e.g. Pickitup in Johannesburg) is addressing the cleaning of settlements, while creating sources of income for households.

In cities like New York, it was found that paying attention to proper maintenance of the urban fabric – fixing broken windows and lights, cleaning streets and graffiti from walls – resulted in a lowering of the crime rate.[80] Through initiatives like city or business improvement districts, several South African cities and towns are now locally trying the same approach with some success.

c) Supporting community

A sustainable settlement should also support the development of the social "glue" that turns a collection of shelters into a vibrant community. This is done by providing meeting places where people of similar interest can get together (e.g. sports grounds, community halls, craft markets, and entertainment venues like theatres and cinemas), and providing opportunities for cultural practices (e.g. places of worship). The responses of South African settlements to this challenge differ widely between urban and rural areas.

In a country with a predominantly young population, there is a strong need for recreational facilities, especially when it is considered that over 40% of people younger than 24 years are unemployed. This need is evidenced in the proliferation of informal soccer fields found, from farm villages like Naledi Village and deep rural areas like Mathabata, to the townships around the metropolitan areas. In poor urban areas, sport is also the preferred route for external agencies to provide recreation facilities. However, the need for sporting facilities in these areas is far greater than local authorities can provide for. In Bethlehem, a medium-sized town in the Free State, there is one large sports facility in the township area, but this is not enough to meet the needs of the 37 football clubs serving a population of more than 30 000 people.

If you are in one of the poorer areas of our settlements or in a rural area, and are in need of more intellectual entertainment, television is often the only option. There are, for instance, very few cinema complexes and theatres in traditional township areas, even in the big metropolitan areas. On the other hand, townships like Atteridgeville, Mamelodi and Soweto (to name a few) have a rich tradition of live music and have been the home of South African jazz for years.

Providing spaces for cultural expression is especially problematic in a multi-cultural society like South Africa. In rural areas, people tend to live a more traditional lifestyle with established cultural spaces serving a homogeneous community. However, in urban areas it becomes difficult to plan the variety of spaces needed to support the cultural practices of each sector of society while ensuring integration. The onus is often placed on the communities to provide such places for themselves.

Urbanisation and modernisation are also (for various reasons) causing a weakening of our different cultures and traditions, while replacing them,. with no truly South African alternative. The result is that we are in danger of the dominant world culture, as epitomised by North America, becoming the unifying culture for South Africa. This brings with it another set of sustainability issues which are not within the scope of this report, but which have serious implications for the social and environmental sustainability of the country.

However, some of our cities and towns are responding to the need to foster a South African culture through support for the entrepreneurial spirit. The City of Johannesburg is attempting to forge a new, uniquely South African culture through the establishment of the Newtown Cultural Precinct and various festivals during the year, and small towns like Oudtshoorn and Clarens

are finding a new lease of life based on their support of local arts and culture.

5.3 The settlement/environment relationship

5.3.1 Resource use

a) Freshwater use

Although water is a renewable resource, it is also a finite resource that is unevenly distributed throughout the country. Water supplies continue to decline as a result of resource depletion and pollution, while demand on the resource is increasing due to population growth, improved service delivery and rapid industrialisation, mechanisation and urbanisation.[81] Water in South Africa is limiting to both economic and social development and a scarcity of supply can often be closely related to poverty, hunger and disease.[82]

South Africa is classified as a water-stressed country. The availability of water is unevenly distributed throughout the country with more than 60% of the water in rivers arising from only 20% of the country's land area. South Africa also has a limited supply of groundwater. The low rainfall levels (half the world average), combined with a high rate of evaporation, results in a low rate of groundwater recharge.[83]

Present trends of water use and population growth in South Africa indicate the availability of water until 2030. This limit will be reached, irrespective of where development takes place in the country.[84] The following table shows the anticipated increase in future water demand.

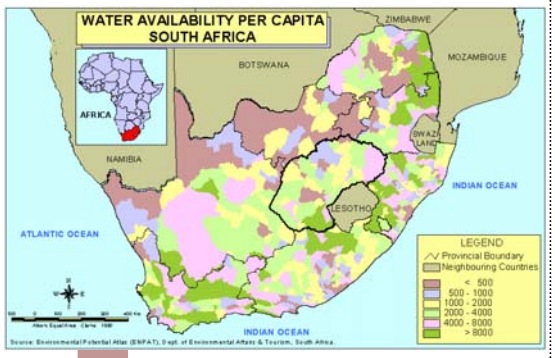
Water use sector	Water demand		Overall % increase
	1996	2030	
Urban (domestic use)	10.8%	22.8%	219.5%
Mining, industrial, energy	8,0%	11.1%	111.5%
Irrigation and forestation	61.6%	52.2%	28.6%
Environment	19.6%	13.9%	7.5%
Average			**51.7%**

Estimated annual water use for 1996, by sector, with projected water requirement for 2030, and the percentage increase for each sector[85]

The calculations of future use do not include all the water use sectors (informal farming, operations and rural communities), or the need for shared watercourses and ecosystem maintenance. These sectoral water use demands are expected to increase by 20 – 30% above the original estimate. It is expected that the largest growth in water demand will come from the domestic and industrial sectors of South Africa, and will be driven by population growth, urbanisation, quality of life, service provision and economic development.[86] It is expected that overall water demand will more than double over the next 30 years, which implies that South Africa will experience acute, and possibly chronic, water scarcity.[87] Because of the spatial variability of water resources and the scarcity of water throughout the country, in many catchments the need for water exceeds the supply.[88]

Most of the predicted scarcity of water is related to consumption patterns of middle- and upper-income groups and of powerful and competing sectoral interests. The location of development, as well as the lack of infrastructure maintenance, further contributes to increased water scarcity. Most of the metropolitan and industrial growth in South Africa happened around mineral deposits and harbour sites, and are situated remotely from major river courses.[89] Current patterns of human settlement and industrial development are therefore not in line with water availability, with large urban conglomerations like Gauteng and the Cape Metropolitan Area situated where local water availability is limited.[90]

The map below shows that the country's main urban and industrialised areas are also the areas with the lowest per capita surface water availability. These areas will become even more water stressed as the population increases and industry grows.



< 500

Availability of surface water per capita

Source: DEAT, ENPAT 1999

It is not the 25 litres of water per capita per day to meet basic needs that threaten natural water resources. The amount of water required to meet the basic needs of the poor in South African cities is likely to be less than that saved through better maintenance of the existing system and more realistic charges for high users. In many municipal areas ageing and leaking infrastructure results in water losses of between 50% and 70%. When water use in

suburbs, where 50% of the country's total domestic water consumption flows into swimming pools and exotic gardens, is compared with water use in the townships and informal settlements, which together are responsible for less than a tenth of household consumption, the need for measures to balance water use between the poor and their wealthier neighbours can be seen as crucial to South Africa's future stability.[91] That said, serious consideration should be given to the kind of services, especially sanitation, that will be provided in new housing developments, as these exert pressure on the water supply if only conventional, high-water-consumption systems are used.

The growing decline in water availability and increased competition for water will also adversely affect food production from rural areas. An increasing number of rural poor are coming to see entitlement and access to water for food production and for domestic use as a more critical problem than access to basic health services and education.[92] Unless there is both new action to recognise the role water plays in rural livelihoods, and an improvement in the capacity of rural communities to manage their water in a sustainable manner, water scarcity threatens to change people's options for production, employment and settlement in rural areas.

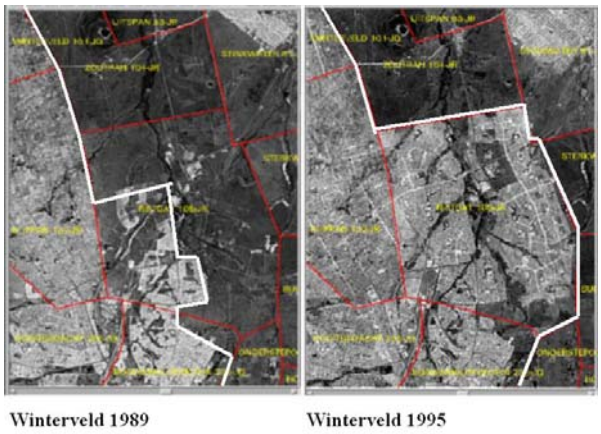
b) Loss of arable land

In 1970 there was 0,86 hectare of agricultural land available per person; in 1980 this had decreased to 0,5 hectare per person and predictions are that in 2020 this figure will decrease further to 0,2 hectares.[93] This has serious implications for income generation and domestic food security.

South Africa's rate of topsoil loss is 20 times higher than the world average.[94] Estimates suggest that this country has lost 25% of its topsoil since 1900 and that 55% of South Africa is threatened by desertification. Current estimates by the Department of Agriculture suggest that less than 4% of the total agricultural land area of the country is high potential land. A significant portion of this land falls in Mpumalanga, where it is subject to fall-out from the power stations and coal mining activities.

An estimated 1,2 million hectares of pastureland in marginal areas of the country are viewed as lost to production due to overgrazing.[95] Associated with loss of productive land will be the inability of subsistence farmers and rural residents to maintain a quality of life that can be sustained directly from agricultural activities and the use of natural resources.

As land cover, settlements represent the most profound human alteration of the natural environment through the imposition of structures, buildings, paved surfaces and compacted bare soils on the ground surface. [96] Up to 16 000 ha of farmland is lost to urban development each year.[97] Urbanisation was estimated to have transformed roughly 2,5% of South Africa's land cover in the late 1980s, but the rapid urbanisation experienced since then, as illustrated below, would have increased this percentage.



Urbanisation in Winterveld between 1989 and 1995
Source: Satellite Application Centre

Several NGO-driven programmes are addressing the problem through encouraging urban agriculture, thereby reclaiming pockets of arable land within urban areas.

c) Energy use

Fossil fuels supply 87% of the total national energy needs.[98] As a result, South Africa falls within the top twenty greenhouse gas emitters in the world, contributing to global climate change.[99] In 1995 South Africa ranked in the top 50 countries in the world and first in Southern Africa in its per capita commercial energy consumption. In terms of energy efficiency, this country ranked very low, falling within the last 50 out of 150 countries.[100] Renewable sources such as water (for hydro-electricity) (0,2%) and biomass (9.8%) provide a further 10% of the country's energy, with nuclear power providing the remaining 3%. Approximately three million households make use of firewood to meet their basic energy requirements.[101]

From the figures below it is clear that human settlements are responsible for the bulk of energy consumption, either directly (residential, commercial and transport sectors), or indirectly through the energy embodied in the materials used in the construction of these settlements and thus through energy consumption in the mining and industrial sectors.

Sector	%
Industry	35.9%
Commerce	4.8%
Residential	24.4%
Mining	6.6%
Transport	23.6%
Agriculture	3.4%
Non-energy use	1.2%

Sectoral consumption of energy in 1997
Source: DEAT, 2000

Levels of knowledge and awareness about renewable energy technologies are also very low. Where a technology has become more accepted, such as solar water heating, it is used mainly by the middle to high-income groups. However, photovoltaic cells are becoming more accepted in rural areas as a result of rural electrification programmes and the provision of solar energy to schools and clinics in rural areas.

d) Waste produced

More than 42 million cubic metres of general waste are generated every year in South Africa, with the largest proportion coming from Gauteng (42%). In addition more than five million cubic metres of hazardous waste are produced annually. The average amount of waste generated per person per day in South Africa is 0,7kg.[102]

There are 730 existing and planned landfill sites across the country, yet it is predicted that, at current rates of disposal, over the next five years landfill capacity will be exceeded by up to 67% in five of the nine provinces.[103] The production of waste is aggravated by increasing urbanisation, resulting in localised concentrations of waste, and pressure around cities for waste disposal sites.

By far the biggest contributor to the solid waste stream is mining waste (72,3%), followed by pulverised fuel ash (6,7%), agricultural waste (6,1%), urban waste (4,5%), and sewage sludge (3,6%). Construction and demolition waste is on average responsible for 40% of municipal waste. Only 25% of urban waste is recycled.

Despite this apparent low rate of recycling, almost every type of paper produced in the country has a recycled content. South Africa also recovers 63% of steel beverage cans. The country further has a high returnable glass-container market: 33% of all glass containers produced are returnable or reusable.[104] Waste recycling is also proving to be an excellent employment generator, with informal employment having been created for an estimated 30 000 people through the Collect-a-Can project.[105]

5.3.2 Pollution and degradation

a) Air quality

Apart from greenhouse gases, the most dangerous air pollution concerns in South Africa are atmospheric concentrations of sulphur dioxide, and suspended particulate matter (incl. smoke).

In general, the worst air quality in South Africa occurs when wood, dung or coal is used as fuel inside poorly ventilated dwellings in informal settlements and rural dwellings. In the most recent study (in Qalabotjha in the Free State, 1997), concentrations of SO_2 of up to 5 200 µg/m^3 were measured for one-hour periods during cooking with coal. The World Health Organisation (WHO) guideline concentrations, which should not be exceeded for a period of more than 24 hours, is 125 µg/m^3. The concentrations of total suspended particulate matter measured indoors reached 1420 µg/m^3 over five hours. The minimum levels of effect on human health were judged by the WHO to be 180µg/m^3 in the presence of SO_2 over a 24-hour period.[106] However, measurements at SO_2 recording sites suggest that the overall state of the atmosphere in South Africa with respect to sulphur dioxide is stable to improving slightly.[107]

Data from the following table suggest that, for many sites in urban areas, especially those near industrial zones, the concentration of smoke particles in the air is higher than desirable – that is, higher than the annual soiling index guideline of 20.

Place	Highest detected	Annual average
Sunderland Ridge, Centurion (residential and industrial)	112	56
Welkom Municipality (industrial)	272	44
White City, Springs (residential)	84	33
Fordsburg, Johannesburg (industrial/commercial)	71	25

Highest average smoke concentration index measured in the National Smoke and Sulphur Dioxide Network April 1997- March 1998.
Source: Van Zyl en Kruger, 1998[108]

b) Water quality

The scarcity of water in the country is exacerbated by pollution of the surface and groundwater resources. Typical pollutants include industrial effluent, domestic and commercial sewage, acid mine drainage, agricultural run-off (pesticides and fertiliser) and litter.

Of concern to water-resource managers are the diffuse sources of pollution that are difficult to quantify. In the past, agricultural runoff, including nutrients, pesticides and herbicides was of major concern. However, the increase in informal settlements, with high poverty levels and inadequate sanitation, may become one of the greatest localised pressures on water quality in South Africa. Human settlements and overloaded sewage systems are the major source of deteriorating microbiological water quality. Micro-organisms and parasites may enter the water system in partially treated sewage effluent, seepage and run-off from inadequate sanitation and waste disposal.[109]

Little information is available on the extent of groundwater pollution in South Africa, particularly with regard to microbiological quality. Salinisation is recognised as a threat, particularly in the eastern and southern Cape and the dry, western section of Northern Cape, and Limpopo Province. Nitrate risk areas (nitrate concentration >10mgl^{-1} as N in >20% of samples) include Northern Cape and parts of Limpopo Province, while fluoride risk areas (fluoride concentration >1.5mgl^{-1} as F in >20% of samples) are the western section of Northern Cape, Eastern Cape and Mpumalanga. Other risks are eutrophication, sedimentation and silt migration, as well as acidification.

5.3.3 Protection of the environment

a) Conservation

The majority of the metropoles do have nature reserves within the metropolitan boundaries, although these continue to come under pressure from development. The National Botanical Institute also manages eight botanical gardens in five provinces, all of them situated in urban areas.

South Africa further has four World Heritage Sites, with the Ukhalamba-Drakensberg Park becoming the 23rd mixed (natural and cultural) site of the 630 World Heritage Sites worldwide. Nearly 7% of the country's surface area is now under either private or governmental protection.[110] Unfortunately, access to these areas is limited to those who can afford to pay the often steep entrance fees. Thus, while privatisation of natural heritage management has ensured the conservation of some of our heritage, and improved profits from foreign tourism, it has also placed that heritage effectively out of bounds for all but the more wealthy local residents.

c) Environmental governance

New legislation, such as the National Environmental Management Act, makes better provision for environmental concerns in urban planning and development. Regulations making environmental impact assessments compulsory for certain developments were promulgated in September 1997.

However, local and provincial government has insufficient capacity to deal with Environment Impact Assessments (EIAs), with many poorer municipalities not having any personnel with the required skills to assess the EIAs done by external consultants, or to prepare and manage Environmental Management Plans within the municipal area. The process is also at times circumvented or diluted for political reasons, especially where EIAs are ignored or downscaled so as to prioritise development, as for example in Cosmos City, Johannesburg.

Another problem lies in the type of laws and regulations available for environmental governance, as well as the support systems for, for instance, proper monitoring of pollution levels. Often the remedies provided by the law are not sufficient to discourage breaking of the law. In many cases, government also relies on a self-regulatory system, where the onus is on the public (with limited knowledge of its environmental rights and even fewer resources to pursue legal objections) to bring transgressors to the fore. Lastly, a lack of proper monitoring and accurate statistics hampers attempts to monitor the environmental impacts of development, such as biodiversity loss and pollution.

5.4 Urban form and structure

Despite a number of efforts and initiatives to address the apartheid patterns of development, South African cities still bear testimony to the legacy of apartheid. The post-1994 housing programme perpetuates this pattern, and continues to provide low-density

housing on the urban periphery for the poor. Business and leisure centres are also becoming increasingly decentralised and the traditional suburbs are expanding to include so-called “country estates” on the urban periphery. Therefore, even today, features of development patterns are:

- large dormitory areas far from places of economic, cultural, recreational and educational opportunity;
- overcrowded former homelands, forced to depend on limited agricultural land, in turn leading to severe environmental degradation;
- substantial inequality between areas set aside under apartheid for white and ”other” (black, coloured and Indian) residential occupation; and
- wide disparities in the provision of infrastructure and services.[111]

Furthermore, there is evidence that the displaced urban settlements, which many thought would disappear after the influx controls of the apartheid government were abolished, continue to grow.[112]

In addition, new forms of segregation, such as gated communities (enclosed neighbourhoods, security villages, etc.), are emerging in which certain of apartheid’s social and spatial divisions are being deepened.[113].

Enclosed neighbourhood, Lynnwood, Pretoria
Source: K. Landman, CSIR

South African cities rank among the most inefficient and wasteful urban environments in the world. This is mainly attributable to low-density urban sprawl, the fragmented nature of cities, strong cultural divisions between residential areas, and the separation of areas where work, shopping and public facilities are concentrated. Rapid population growth and urbanisation in the past has increased the problem of urban sprawl through the growth of peripheral formal and informal settlements (see Appendix B, section 9, for more on urbanisation). Low-density urban sprawl consumes vast tracts of land – much of it agriculturally productive each year: so food for an increasing population has to be produced on a diminishing amount of land. Low-density development requires large investment in the development and upkeep of infrastructure, which the less affluent communities cannot afford. The efficiency of public transport is also strongly linked to urban density.[114]

Road transportation is by far the fastest-growing source of carbon emission, thus contributing towards climate change. In South Africa the transport sector is responsible for 21% of the current energy consumption in the country. Of this, 58% of energy went to land passenger transport.[115] In 1998, the transportation sector was responsible for 17,5% of total carbon emissions. Urban sprawl is therefore responsible for a considerable amount of the country’s greenhouse gas emissions.

Urban sprawl is not an unstoppable force and Johannesburg is leading the way, with the establishment of an urban growth boundary. It should also not be seen as wholly negative. Urban sprawl may have some benefit if it can be used to encourage urban agriculture, and thus increase food security and provide sustainable livelihoods for the unemployed in urban areas.

Care should also be taken that principles of densification are only applied where appropriate. In rural settlements where families rely on subsistence agriculture, including stock farming, and extended families share a homestead, densification may have disastrous results.

All spheres of government are faced with three major challenges concerning spatial transformation in the 21st century:

- integration of and within cities;
- developing previously disadvantaged areas to the same extent as previously white areas, from infrastructure investment; housing delivery and the development of well-functioning public facilities to providing effective service delivery; and
- curbing the continuation of current patterns of sprawl and segregation.

Whether this is possible within our ecological and financial resource base and current levels of political willingness to change still needs to be answered.

5.5 Conclusions

The sustainability profile of a settlement depends on whether its inhabitants are rich or poor, whether it is in an urban or rural area, and whether one is looking at it from a quality of life or an environmental perspective. Its finer grain of location (urban core or urban fringe) has a smaller, though no less important, role to play.

5.5.1 Quality of life

The table below gives a quick overview of the quality of life provided by different settlement types, based on location and shelter type. Each settlement type is rated for how well it performs according to the key quality-of-life determinants identified in Chapter 4.

	Inner city	Suburb	Township	Informal settlement	Peri-urban	Rural village	Farm village
Health	☺	☺	☹	💣	☹	💣	☹
Safety	😐	😐	💣	💣	😐	😐	😐
Shelter	☺	☺	😐	💣	😐	😐	😐
Productive life	☺	☺	😐	😐	💣	💣	💣
Information and participation	☺	☺	😐	😐	💣	💣	💣
Quality of built environment	😐	☺	☹	💣	☹	☺	☺

☺ - Comparatively good
😐 - Some aspects good, some bad
☹ - Not good overall
💣 - Very bad

Comparative quality of life provided by a range of settlements

This is a very generalised view, and would not be true in every settlement of the particular type. For instance, the quality of life provided by the inner city of Cape Town is very different from that provided by the inner city of Johannesburg.

Accepting the limits of generalisation, it is clear that the quality of life experienced in suburbs is far better than that experienced in informal settlements.

a) Health

People living in the inner city and suburbs tend to have higher levels of services, which make them less vulnerable to disease. In the inner city of Johannesburg, this advantage has been compromised by infrastructure that is collapsing due to age and overcrowding, and services that have been cut off because of non-payment. While there are considerable levels of air pollution in our cities, indoor air pollution is much lower in the inner city and suburbs.

People living in formal housing in townships have lower service levels than those in suburbs and high levels of indoor air pollution, with a corresponding effect on their health. However, township dwellers have a lower vulnerability to disease than those living in informal settlements where a lack of services, overcrowding and vulnerability to a range of hazards make these settlement types the unhealthiest places to live.

While conditions in displaced urban settlements are slightly to much better than those in informal settlements connected to urban areas, conditions of life in rural villages pose serious threats to the health of their occupants. These are the settlements where people still depend on water from rivers and streams that are often contaminated with bacteria and other organisms. On the other hand, these areas often offer better food security than informal settlements. While service levels tend to be low in farm villages, most farm workers have access to clean water and some land for subsistence agriculture, which improves their health outlook.

As for access to health care, those living in suburbs and the inner city are again best off, as most can afford private health care and are close to health-care facilities. However, housing conditions and levels of affordability of households living in some inner city areas reduce the potential advantages of the levels of access to health facilities that exist. For the other settlement types, distance to health facilities severely curtails levels of access and benefit.

b) Safety

Life is considerably safer in the inner city and in the suburbs than it is in informal settlements and townships where the highest incidences of violent crime take place. While the crime rate is lower in rural areas, these areas are more vulnerable to natural disasters. Informal settlements are probably the most dangerous places to live, as they have both a high incidence of violent crime, and very high vulnerability to natural and man-made disasters due to their location on marginalised

land, the temporary nature of shelters and vulnerability to fires.

c) Shelter
If an uncritical position is taken, without measuring some of the impacts of high service levels, suburbs provide the best shelter conditions, with low densities, good quality housing, security of tenure and high levels of services. This is also the case in some inner city areas. And while houses in suburbs are expensive, the house-price-to-income ratio in South African suburbs is much lower than that in townships and compares very favourably with the rest of the world.

Shelter conditions in established townships perform well in some areas, more poorly in others. There are some concerns about service levels and their affordability, as well as the quality of newer housing provided, but there is some form of secure tenure for most inhabitants.

Rural areas and farm villages perform badly in terms of security of tenure and level of services, but have lower densities and in many cases an acceptable quality of housing. If properly built and ,maintained most traditional housing provides a superior dwelling than those delivered by some of the formal housing projects or found in informal settlements.

Again, informal settlements provide the worst shelter conditions with few or no services, insecure tenure and inferior housing quality in terms of the materials and structures used. However, many informal dwellings are more spacious than the formal houses provided under the housing subsidy scheme.

As regards special needs housing, it is once again a matter of wealth and geographical location that determines access, with wealthy urban dwellers being far better able to access appropriate housing and services than poor rural dwellers.

d) Productive life
Access to livelihoods, education and economic resources is far better for those living in suburbs and the inner city than it is for those living in townships. Access to these opportunities is severely restricted for those living in informal settlements around small towns and in rural areas, but slightly better for those in informal settlements in urban areas. Access to livelihoods may be slightly better in rural areas where subsistence agriculture is possible. Mobility is a serious concern for all, except for those in the suburbs and inner city areas.

e) Information, participation and self-determination
Connectivity and accessibility is severely restricted in rural areas, but improve the closer people get to an urban area, with the best conditions in suburbs and the inner city. In principle, people in all settlement types should be able to participate in decision-making that affects them as the policy guidelines exist to ensure this. In practice, factors like connectivity and mobility, as well as education levels combine to marginalise those living in rural areas and informal settlements in processes such as the IDP. However, participation plays a far larger and more in-depth role in development programmes in rural areas than in urban areas.

f) Quality of the built environment
The quality of the built environment is also better in suburbs than anywhere else. These areas tend to be well maintained, with well-developed gardens (which also have a cost to the environment, as described above). The per capita access to recreational and cultural facilities in these areas is also considerably higher than in other settlement types. Rural areas also score well in this category, as they provide access to green spaces and have strong access to cultural heritage. Informal settlements score lowest, closely followed by peri-urban areas and townships. However, the quality of the built environment, as with most of the other criteria discussed, can differ widely from settlement to settlement of the same type.

5.5.2 Settlement/environment relationship

It is often assumed that poverty is the cause of, or at least a major contributor to, environmental degradation. However, this is not generally the case, except in relation to the immediate living environments of the poor.[116] An exception is the large-scale degradation of land in the previous homelands – a result of large concentrations of people and livestock on marginal land. Seepage from informal settlements is also contributing to groundwater pollution in urban areas, while air pollution caused by wood and coal fires is a major factor in the larger cities. Yet many of the impacts of these problems are localised and limited in volume. In low-income settlements, environmental problems are a major cause of disease and death, while the contribution to global environmental degradation remains small. As settlements become more affluent,

environmental burdens tend to become more diffuse, delayed and indirect. This tends to result in the displacement of environmental burdens.[117] Because of their low levels of resource consumption, and their tendency to re-use and recycle, poor communities also have a negligible distal environmental impact, compared to more affluent communities.

The characteristics of the environmental impact of settlements on the biophysical environment and *vice versa* differ widely between rich and poor settlements, as well as between urban and rural settlements. The more affluent settlements are responsible for more consumption and distal impacts, such as greenhouse gas emissions, than those in poorer areas. Those living in poorer areas are responsible for more direct environmental impacts, such as air pollution (indoor and ambient), pollution of watercourses, and deforestation around settlements and concomitant soil erosion. The latter impacts are specifically common in rural and peri-urban areas.

If we look at the use and patterns of consumption of resources demonstrated in the table below, those living in suburbs have a disproportionately large impact on the resource base. While wealth is a key determinant in the level of consumption, other factors such as service levels also contribute to increased consumption.

	Suburban	Township	Informal
Access to floor space	33m^2	9m^2	4.5m^2
Water consumption	350 l / person/day	50 l/ person/day	<50 l/ person/day
Waste generation	0.8-3kg/ person/day	0.2-0.8kg/ person/day	<0.2 kg/ person/day
Electricity consumption	900 kWh/ month	83 kWh / month (pre-paid system)	Same as townships when formalised
Car ownership	490 cars per 1000 of population	30 cars per 1000 of population	

Consumption and waste by urban settlement type
Source: M. Napier, compiled from other sources[118]

The South African city structure that places the poor in townships and informal settlements on the periphery of settlements and in displaced urban areas far from job opportunities further increases the environmental impact of these settlements due to their increased transportation need. The growth of security estates (golf estates, country estates, etc.) on the urban periphery also increases the environmental impact of settlements on the urban periphery.

As concerns the impact of the biophysical environment on human settlements, those in informal settlements and in rural areas are more at risk from natural disasters such as flooding, severe storms, mudslides and fires. People living in these areas can also not afford to protect themselves through insurance or other risk management options.

5.5.3 Institutional ability of municipalities

In general the institutional ability of Category A municipalities is far better than any of the other types of municipalities. Lowest scores would go to rural municipalities in the poor provinces. However, the levels of financial sustainability experienced in all but a few municipalities, as well as the manifest shortage of skills and capacity, are cause for grave concern for municipalities across the board. This is not aided by the confusion resulting from the recent demarcation process regarding the different responsibilities of provinces, district councils and municipalities, and the many cross-border municipalities and district councils.

5.5.4 Urban form and structure

South Africa's cities and towns continue to grow according to unsustainable patterns that place the poor far from opportunities. There is also little likelihood that displaced urban areas will cease to exist or develop a viable economic base in the foreseeable future. Furthermore, new forms of spatial exclusion are being developed, deepening the level of social exclusion. Urban sprawl is also severely hampering efficient and feasible service delivery, while unnecessarily increasing resource consumption and climate change.

5.5.5 General conclusions

There is no doubt that the quality of life for the majority of South Africa's citizens has improved considerably since 1994. The vast majority of people now have access to shelter and basic water, sanitation and electricity services, and for the past two years there has been an annual real increase in household income of 0,6%.[119] However, there are many concerns regarding the long-term sustainability of these gains, as well as of the settlements that have been created.

If the impacts of settlements occupied by both the wealthy and the poorest are properly

measured, by no stretch of the imagination can South African settlements be described as ecologically sustainable. The combination of the spatial characteristics of these settlements, the extent of the existing needs (and the accompanying aspirations) that have to be met, the low levels of institutional support, and the very real financial and environmental constraints, all provide an enormous challenge.

Local government is unable, and in some cases unwilling, to make the necessary decisions to implement better practices, and communities often do not have access to relevant information and hence are unable or unwilling to pay for access to appropriate services. All parties are hesitant to accept and implement more sustainable technologies and processes. Yet, there are a number of examples where small steps in the right direction have been taken (as identified in the case studies and the best practices study). Hopefully these will continue to build momentum until they become the norm. However, for this to happen, a number of institutional barriers will need to be removed. National policy is starting to address some of these issues. The following chapter addresses institutional strengths and weaknesses in more detail.

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Chapter 6: Policy pressures and responses

6.1 Introduction

Following a very broad view of human settlements and the factors that contribute to their sustainability, this chapter narrows down the discussion to the policy responses and institutional capacity that address the planning, financing and creation of settlements. One objective of this study is to identify possible policy gaps. A number of central policies are reviewed in this chapter, and a much broader range of policies is summarised in Appendix C. This review of policies, programmes and institutional capacity has been approached in terms of performance relative to the principles of urban sustainability and sustainable development identified in Chapters 1 to 4, and existing problems which were identified in Chapter 5. In reading this chapter it should be understood that policy and public sector activities to address sustainability issues are both a pressure on the environment, and a response to existing situations. Once amended policies are implemented, they set up new pressures which further alter the environment.

Since 1994, Parliament has passed 29 Acts and an equal number of Amendment Acts that directly refer to the creation and management of human settlements. Supporting the legislation is an equally larger number of policy documents and an even larger number of implementation programmes. Within the scope of this study, it would be impossible to review all relevant legislation, policies and programmes, assess them for their contribution to the creation of sustainable settlements and fully explore the conflicts, weaknesses and gaps. The following is therefore a broad look at the most important of these policy documents and programmes in order to identify the key weaknesses, tensions and gaps.

6.2 Government policies

6.2.1 The Constitution of the Republic of South Africa

Housing is a fundamental right embodied in the Constitution (section 26), which states that every citizen of the country has a right to have access to adequate housing.

The Constitution also states that:
"*Everyone has a right –*

- *To an environment that is not harmful to their health or well-being; and*
- *To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation; promote conservation; and secure ecologically-sustainable development and use of natural resources while promoting justifiable economic and social development."*

This encapsulates the well-known definition of sustainable development as defined in the Bruntland Report and makes it applicable for South Africa and challengeable in court.

6.2.2 The Reconstruction and Development Programme (RDP)

The RDP was developed in 1994 as the first attempt to provide a revised policy framework on development for a new democratic country. The RDP is directed at meeting the basic needs of the people of South Africa through six basic principles:

- integration and sustainability;
- people-driven processes;
- assuring peace and security for all;
- nation-building;
- linking reconstruction and development; and
- democratisation.

The concept of sustainability therefore started to feature in government policy as far back as 1994. The RDP identifies sustainability as one of its principles and therefore opened the door for further development of the concept in future policies. The RDP encapsulates a very people-centred approach and starts from the premise that it is necessary to provide equal opportunities to all and ensure the growth of all people to ensure long-term sustainability in human settlements.

6.2.3 Growth, Employment and Redistribution (GEAR) Strategy (1996)

The government developed this strategy subsequent to the 1994 RDP. This macroeconomic strategy aims to strengthen economic growth in South Africa with a broadening of employment opportunities and the redistribution of economic opportunities and income in favour of the poor. Central to this strategy is achieving a competitive fast-growing economy in South Africa. However, it is not clear whether increased competitiveness between countries and cities within South Africa will always support the idea of the redistribution of economic opportunities.

Some would also argue that there are underlying contradictions between the RDP and GEAR in terms of economic growth and development versus provision of basic rights. Suffice to say here that both policies, to a greater or lesser extent, plot the direction of current South African policy thinking. GEAR may also be questioned in terms of its implications for long-term or "strong" sustainability. While economic sustainability is an important prerequisite for sustainable development and human settlements, it cannot be viable over the long term without a balance in terms of biophysical and social sustainability. It is in terms of the last two dimensions of sustainability that GEAR may prove to be somewhat insufficient or contradictory.

6.3 Emerging policy trends and pressures

It is possible to further examine some of the trends that are emerging from the tension between existing policy modes of thinking.

6.3.1 Providing for basic needs

One of the key responsibilities of the national government is to provide for the basic needs of society and to do so in a manner that is affordable to both the state and the beneficiary.

With huge backlogs in housing and services, the government has focused on meeting quantitative targets, and municipalities are often coerced into meeting these targets at the expense of quality and long-term planning. The result has been new settlements of variable quality and durability. While a vast number of people have been provided with improved shelter and secure tenure, the resultant settlements lack the social and economic infrastructure that creates liveable settlements. It is widely acknowledged that the main pressure on government now is to improve the quality of delivery, while meeting the quantitative targets that have been set in an affordable manner.

While the focus has been on the affordability of capital costs, there is increasing pressure to provide for basic needs in a way that is affordable to the beneficiary as well. This means not only that the use costs should not exceed what the beneficiary is able to pay in terms of income, but that the service delivered is one for which the beneficiary is prepared to pay.

The post-apartheid government is also under pressure to provide secure tenure and redistribute land to those who have previously been prevented from acquiring land. Unfortunately, some of the mechanisms created for this process have resulted in the displacement of farm workers and extensive rural-rural migration, leading to the unsustainable growth of small towns (as outlined in more detail in Appendix B, in the section on "Demographic change").

6.3.2 Macroeconomic policy

Economic policy in South Africa is greatly influenced by neoliberal economics – that is, privatisation or public/private partnerships or joint venturing, reduced social expenditure, free trade, free capital mobility and the commodification of nature. Described by the Growth, Employment and Redistribution Strategy (GEAR), the country's macroeconomic policy is in itself a response to the force of globalisation, seeking the full re-integration of the country into the global economy, making it an attractive location for foreign investment, enhancing the role of the private sector, and reducing the role of the central state.[1]

The adoption of this economic policy was prompted to some extent by budgetary constraints and skills deficits throughout

the public sector that greatly inhibited meeting the demand for services. Faced with this situation, the government moved away from being the exclusive provider and financier of infrastructure services to being, rather, the regulator of selected services provided privately through public-private partnerships (PPPs).

In human settlements, this economic policy has resulted in three main pressures.

The first is privatisation, or public/private partnerships for service delivery, which is manifested in a number of ways. Some local authorities such as that of Johannesburg are privatising their utility companies, which means that these companies are now profit-driven. In the small town of St Lucia, municipal functions were outsourced to the point where the town employed only two people: a town clerk and a secretary, who just negotiate contracts with private providers.[2] This raises serious concerns in terms of upgrading of marginalised areas, and economic viability when large proportions of the population cannot afford to pay for services.

The privatisation of service delivery is also found in gated communities (including enclosed neighbourhoods and security villages). Residents in enclosed neighbourhoods often opt for the privatisation of services such as park maintenance, etc. This trend is taken further in large residential security villages where a whole range of services are privatised, such as park and garden services for communal areas, security, education, etc. In a few, provision is made for emergencies through backup services in terms of water and electricity provision – for example Dainfern in Johannesburg.

The second, closely related, pressure is the privatisation of urban space. This is due partly to government policy as discussed above, and partly to the changing nature of development companies and the entry of the finance industry into built environment production and management. Large-scale developers and financiers have a need to safeguard and maintain their commodities for investment – hence a tendency to reduce all levels of uncertainty which could threaten their interests.

There is a growing trend in South Africa to formally or informally privatise public spaces in urban areas through road closures and neighbourhood enclosures. While some local authorities only allow closure if the entire area is privatised, others allow for either privatisation or closure where the roads will still remain the property of the municipality. However, in many cases, these so-called public areas are controlled in such a strict way that they actually start to operate as private areas.[3] Ultimately the privatisation of services and urban space also leads to the privatisation of local governance. This is expressed most clearly in the formation of Business Improvement Districts or City Improvement Districts, where businesses take responsibility for the maintenance and security of the space around them. However, there are many forms of private municipal governance, including private residential communities (cooperatives, homeowners associations and condominiums)[4], retail communities (leisure complexes), industrial communities (industrial parks), and services communities (office parks). They supply civic goods (for example, protection, cleanliness, environmental improvements, etc.) and they represent individuals voting for a management body to manage and control affairs.[5]

The third pressure relates to the spatial distribution of investment. The Spatial Development Initiative (SDI) programme aims to identify areas with potential for economic growth and to unlock this potential with critical contributions from government – i.e. using public resources to leverage private-sector investment. SDIs involve promoting a geographic area for investment through creating job opportunities, raising the profile of the location, improving delivery expected of state-owned enterprises, concessioning of public/private partnerships, support and promote leading economic sectors, etc. Furthermore, it involves preparing the location for investment through delivery or upgrading of infrastructure, strengthening the local skills base and institutional capacity (and service delivery), and providing environmental management frameworks.

According to the government[6], the aims of SDIs are:

- to promote export orientation amongst South African firms;
- to earn foreign exchange;
- to ensure sustainable job creation;
- to ensure better utilisation of infrastructure and resources; and
- to broaden the ownership base of the economy.

The concept is a short-term, fast-track process that removes obstacles to investment and provides the necessary infrastructure to encourage the private sector. Associated with SDIs are national and trans-national Development Corridors, as well as Industrial Development Zones (IDZs). These are purpose-built industrial estates linked to an international airport or port, in which quality infrastructure and expedited customs procedures are coupled with a unique duty-free operating environment suited to export-oriented production.

SDIs have a direct influence on the distribution of investment, particularly the investment in and development of infrastructure. In a recent analysis[7], SDIs were held against economic theories that promoted the concepts of "core" and "periphery" in relation to the location and concentration of industries. In the context of South Africa, core areas referred to economies in the interior (such as Gauteng), while the peripheral economies are the coastal cities (in KwaZulu-Natal, and Western and Eastern Cape). The analysis acknowledged that to reach the objective of job creation, SDIs should be located in areas of economic growth and the core of the economy, and in order to attract private investment, high levels of infrastructure investment are required. This is indicative of a shift of investment in social and enabling infrastructure from areas of need to areas that display potential for economic growth.

From an economic development perspective, SDIs have been credited with the potential for job creation. Since its inception, the SDI programme has created almost 100 000 jobs against a capital investment of R164 777 million.[8] However, many of the anchor projects around which the SDIs are planned are associated with the processing and beneficiation of natural resources. Internationally competitive resources–based industrialisation strategies tend to be small employment generators and dependent on a highly skilled workforce. Such a strategy is therefore incompatible with the stated aims of job creation.[9]

While job creation does lead to more economically stable societies, the creation of jobs in a specific location often stimulates increased migration to these areas. The result is increased demand and expenditure on social (health, housing, education) and enabling (transport, ITC, water and sanitation, etc.) infrastructure; and an increased burden on the natural resources of the area. Many of the proposed SDIs are in areas that are unable to sustain prolonged increases in human and industrial densities. In the long term, densities may be forced beyond sustainable levels. There are also other environmental concerns, such as the sale of development packages in areas of high tourism potential to fund road development. In sensitive areas such as the Wild Coast, this can lead to serious environmental damage. The SDI process does require that a strategic environmental analysis be performed for every SDI. However, this is no guarantee that the environment will be protected, and that the full environmental impact of the SDI (including auxiliary impacts through, for instance, increased in-migration of job-seekers) will be factored into the project costs.

The previous paragraph touched on the implications for human settlements within the SDI zone. However, SDIs also impact on the areas from which the job-seekers originate. With the primary economically productive workforce leaving the area in search of employment in areas where SDIs are active, their areas of origin are drained of the skills that may have sustained much-needed growth in the local economy. This further perpetuates the pattern of urban-rural cross migration, with its associated social impacts, that characterised the apartheid era.

The ability of SDIs to accelerate job creation, alleviate conditions of poverty and promote self-sufficiency among local communities still has to be tested. The

programme has been less successful than anticipated in attracting investors, but has motivated considerable public-sector infrastructure investment in a few focused areas in the poorest provinces. However, there is the danger that these investments may suffer the same fate as those in the previous homelands, where a similar spatially based investment policy was followed. These homeland industrial zones have been abandoned in favour of the new SDI strategy, leading to mass unemployment in these areas, and a loss of millions in terms of investments by the private sector and local property owners.

6.3.3 Local government restructuring

In order to address past inequities, a major restructuring of local government has been undertaken. This restructuring process has in itself become a key driver for change, and has three main elements that place pressure on settlements: municipal transformation, integrated development planning, and developmental local government.

The municipal transformation process has taken place at both spatial and institutional levels. By combining municipalities, cross-subsidisation between highly-serviced and under-serviced areas has been made possible. Overhead costs have also been cut, resulting in leaner institutions that will hopefully be more efficient. The process has also created a number of new local authority typologies (see Chapter 3) with different roles and responsibilities. The result has been less than desirable (see Chapter 5), and the changes are placing additional pressures on already inadequate resources and skills levels. It will take some time before the transition has been fully internalised and the benefits can be reaped.

The legal requirement for integrated development planning at local level is forcing further change onto local authorities. While the application of integrated development planning will no doubt improve the sustainability of settlements, many local authorities are not equipped to deal with the demands of the process. Progress is further hampered by the fact that there is little or no integrated planning at national or even provincial level.

Lastly, the Constitution, as well as new legislation, is placing the responsibility for development squarely on the shoulders of local authorities, many of which are not equipped to deal with this new responsibility. The macroeconomic policy followed by national government is also requiring local authorities to rely on their rates base (with only a small amount coming from national revenue through the equitable share) to fulfil their developmental responsibilities, including the provision of lifeline services. For many this is not feasible.

Thus, while the transformation of local government was a much-needed exercise, the process is painful and, unless the capacity and skills problems experienced by municipalities are addressed, and municipalities provided with the means to fulfil their new responsibilities, the transformation process actually poses a threat to the sustainability of many settlements in South Africa.

6.4 Policy weaknesses, conflicts and gaps identified

The review of policy[10] and the above discussion of some of the pressures that have emerged in the policy environment lead to a number of specific observations about how well-coordinated policy can achieve sustainable human settlements. Generally, there has been a significant growth in understanding of sustainable development principles in policies since 1994. However, despite this encouraging trend, a few gaps and weaknesses have become apparent.

6.4.1 Defining terminology

It is important that terminology should be used carefully in future policies, especially in relation to implementation – or, in other words, how the principles would be applied in practice. It is of little use to identify integration and densification as principles in policy documents without accompanying these principles with practical ways to manifest them in human settlements. The same applies for the terms “sustainable development” and “sustainability”, which are often used interchangeably or in relation to other

concepts, without considering the practical implications.

It should also be recognised that principles cannot be presented in a blanket way, but need to be adaptable to local conditions.

6.4.2 Defining government roles and responsibilities

There is a need to properly define the roles and responsibilities of different municipal structures in terms of exactly what is required from each type of local council to adequately deliver services and guide and implement development on a local level.

It is also important to ensure correlation between policy documents (which are often based on normative principles) and legislation and local regulations (practical mechanisms to guide implementation and enforce specific outcomes).

6.4.3 Policy without implementation guidelines

The majority of policies in South Africa are of a very high standard and compare with the best in the world. In many cases, however, policies (and even legislation) are written without properly thinking through how that policy can be implemented and what the implications on the ground will be. There is an apparent inability to sufficiently develop methods and mechanisms of implementation that will be implementable within the South African context and readily understood by all the implementing agents.

6.4.4 Level of state control or involvement

A number of policies increasingly highlight government's tendency to pull back and play an enabling role, rather than provide houses and services directly. The result is greater pressure on NGOs and communities to take responsibility for delivery, or to privatise service and housing delivery.

While government is in the position to ensure equal distribution of facilities and the provision of services and strive towards the improvement of the quality of these in disadvantaged areas, private companies are more likely to be concerned only with cost-recovery, both in terms of initial implementation and ongoing service provision. It is questionable whether this will improve economic and social sustainability in human settlements when too many areas are not yet in a position to respond to a market-centred approach.

6.4.5 Community participation

The RDP emphasised the crucial role of community participation to ensure that the democratic process is taken down to grass-roots level. Many of the more recent policies, however, do not give significant recognition to this issue and either mention it without describing efficient methods to enforce it, or do not mention it at all. Without sufficient community participation, self-determination cannot be achieved sufficiently and this may hamper the sustainability of human settlements in a very significant way.

There also seems to be a tension between community empowerment or disempowerment. While a number of policies highlight the need for community participation and skills transfer, many ignore the role that community-organisations such as civic groups, labour unions, etc, can play to increase democratic participation.

Having said that, community participation has had a varied success rate. It works well in the People's Housing Process, but is behind the collapse of many water projects and urban service-delivery programmes. The level and type of community participation therefore needs to be clearly defined in both policy and programme planning.

6.4.6 Bio-physical/economic sustainability tensions

While a number of very focused policies have been developed to promote environmental conservation, resource preservation and biodiversity, these issues often seem to be ignored in policies promoting economic growth and globalisation. There seems to be a conflict between longer-term ecological protection and short-term delivery and economic goals. The latter often means that the natural environment is still coming second.

The situation also highlights the fact that that the wide range of post-apartheid policies often contradict each other or do not align in terms of broader governmental objectives. Or perhaps it is the question of the interpretation and agreement of what the broader government objectives are that is at fault.

6.4.7 Urban- rural tensions

There is a lack of consistency in terms of the approaches endorsed by a variety of policies addressing the issue of urban and rural development. Although it is essential that urban and rural development should be considered in an integrated way at a strategic level, it should be recognised that the same policies cannot be used everywhere or that an integrated policy cannot be implemented in the same way in urban and rural areas.

Recent policies and legislation endorse a more integrated approach to urban and rural development, by combining both urban and rural areas in local municipalities. This places increased pressure on these institutions to strategically consider issues in an integrated way, yet approach upgrading and development in different ways. Considering the capacity and level of skills within some of the municipalities, this may prove too daunting for many local municipalities and in turn have a negative impact on the sustainability of settlements within these jurisdictions. Alternatively it may lead to an urban bias in terms of development priorities, as was experienced in some of the case study areas.

6.4.8 Greater local power vs more centralisation

There is a tension between increased centralisation on the one hand and the promotion of greater local responsibility on the other. While a number of policies place a bigger responsibility on local government, others emphasise a top-down approach towards development. On the one hand there is a call for developmental government and greater local autonomy and on the other there is increased centralisation in terms of the control and distribution of funds, as well as the development of national frameworks to guide local development plans.

This places increased pressures on local municipalities, which are given bigger roles to play in policies, but less power and resources in practice. Policies therefore often do not align with what is taking place in reality or alternatively have limited impact beyond its development on paper.

6.4.9 Policy gaps

We can therefore conclude this section by observing that there are two main areas where policy is not yet adequately addressing the sustainability problems of human settlements.

The first is in terms of environmental impact, where the problem is on two fronts. Policies for the mitigation of harmful environmental impacts focus almost exclusively on low-income housing, and ignore the environmental impact of increased consumption levels in more affluent areas and the commercial and industrial sectors that form part of settlements.

By adopting a self-regulatory approach with few strong disincentives for transgressors, there is also no incentive for industries and the service sector to reduce their resource use and pollution levels, thus missing the opportunity to provide more equitable access to resources and improved quality of life for their neighbours. While the “polluter pays” principle introduced in NEMA goes some way to addressing this, the fact is that a self-regulatory approach makes it difficult for communities, and even local authorities, to take transgressors to court. There is no consistent, independent monitoring of emissions that can be used as evidence, and the affected communities can rarely afford to pay for these studies, or for the subsequent legal processes.

The second main gap is in terms of integration of funding sources. Policy supports the idea of integrated development and settlements, yet the financing mechanisms that exist often hamper integrated planning. The many different housing subsidies tend to group people of the same income group together and force the separation of tenure types, thus preventing cross-subsidisation of infrastructure and services and the

creation of livelihood opportunities. At a higher level, the lack of integrated funding mechanisms for human settlement development allows the creation of settlements without adequate supporting social infrastructure, such as schools, clinics and police stations.

6.5 Institutional ability to implement sustainable development

The discussion up to this point has primarily addressed whether policy is adequately addressing sustainability issues. There has been some mention of trends emerging in government capacity. Here we wish to better understand the extent to which the good intentions of policy in creating sustainable settlements are likely to be achieved through existing institutions.

6.5.1 Political and institutional will

At a national level there is strong political support for sustainable development, although the understanding of what this means is often imperfect. Under pressure to redress past inequity, national settlement development policy focuses strongly on the Brown Agenda. This in itself is not bad, as the environmental conditions both imposed on and created by the poor are of great concern. What is worrying is that addressing this Agenda is done from a weak sustainability point of departure. Thus, while we are improving the lot of the current generation of South Africans, the decisions we are making now will have serious repercussions in the future. Most human settlement policy also focuses on meeting the needs of the poor, while ignoring the impact of the more affluent sectors of society on the future sustainability of our settlements.

At local government level some municipalities like Kimberley and the metropolitan areas are also showing strong political support for sustainability. How this is interpreted and translated into practice is a different matter, and there is a big difference between political will to truly implement sustainable development policies and political lip service to a concept that is not properly understood, but which make for good "sound bites".

The link between environmental and financial sustainability is especially poorly understood.

Johannesburg Vision 2030

Johannesburg's Vision 2030 is a good example of where financial sustainability is pursued without paying adequate attention to the environmental feasibility of the proposed development path.

While the city has a department responsible for environmental management and state of the environment reporting, the findings of this department are all but ignored in the vision of the city that is focused on sustained economic growth, and providing improved standards of living.

According to the "Joburg 2030" Vision the output the City is looking for is a "better city". This is to be achieved by:
"*a sustainable increase in the standard of living and a sustainable increase in the quality of life for all the city's residents*."

The two outputs are to be measured by increases in GGP per capita and human development index increases respectively. A quick reference is made under "Quality of life" that measures will be put in place that will result in acceptable pollution levels, that waste production and litter will decrease, and that the biodiversity and animal life for which Africa is famous will be supported. Nowhere is any mention made of addressing the biggest threat to this vision – the fact that Gauteng simply will not have the water to support the kind of city Johannesburg wants to be in 2030. And while the taps may not run dry, the increased cost of water and fierce competition for water could have serious financial and social repercussions.

Other worrisome aspects are the idea that a crime-reduction strategy can involve: "*purchasing safety and security 'products' from the Criminal Justice System and the South African Police Services*." ; and the notion that the poor can be "*concentrated in special needs areas*".

Johannesburg also has what is termed a "Sustainable Housing Strategy". The vision, principles and objectives have all the right words for the creation of sustainable human settlements. However,

when it comes to identifying strategic programmes, the agenda becomes murkier. The integration of what is called "sustainability issues" is to be limited to specific housing projects, and quantitative targets are to be set for housing delivery, without accompanying targets for the environmental performance of new housing products.

It is therefore doubtful whether the housing delivered by the City of Johannesburg will live up to its vision of sustainable housing except in a few showcase projects.

The question arises that if a relatively wealthy, sophisticated, well-resourced city like Johannesburg does not fully understand what is required to change to a sustainable development paradigm, and translate this into policy that will have a sustainable human settlement as outcome, what chance do the poorer municipalities have?

Another cause for the mismatch between policy and implementation is the fact that many local authority officials are simply not aware of (a) what is required of them, and (b) the options available. A recent study by the CSIR[11] has identified the following institutional barriers to sustainable development in local authorities:

- A lack of understanding among the different stakeholders of what sustainable development entails and the benefits it can bring to the local authority, the community and business. This also contributes to conflicting policy directives and a lack of clear protocols.
- Political interference and power struggles at all levels of the process, as well as a lack of understanding or awareness of sustainable development issues by politicians.
- An unwieldy and rigid bureaucratic process causing long turnaround times and a top-down, sectoral management structure.
- The sectoral organisation of budgets, which makes the funding of integrated projects extremely difficult.
- A lack of capacity within the local authority to effectively plan, implement and manage interventions for sustainability, coupled with ineffective regulatory instruments.
- Resistance to change within both the municipality and the public sector.
- Insufficient capacity of municipal officials in terms of both knowledge and time (including time to improve their knowledge)

Where policy does exists, there are few supportive regulatory measures and little coordination between national policy and local authority regulations. An example is the Urban Development Framework's support of urban compaction and densification. While this can be applied for new developments, local regulations often make it impractical, if not impossible, to densify existing residential areas. The costs and time involved in converting an existing suburban plot into two or three sectional title holdings are often prohibitive. Arguments that state that this would place an increased burden on services are not necessarily true, as in many cases the changing household profiles in suburbs mean that, while the housing density may increase, the population density does not actually increase.

6.5.2 Institutional integration and cooperation

As part of the drive for greater integration and improved efficiency, it was decided to re-demarcate all local and district authorities in the country. In December 1999 the Demarcation Board of South Africa published the newly determined metropolitan, local and district municipalities and their borders in accordance with the Municipal Demarcation Act (1998). A total of 284 municipalities have been demarcated: six metropolitan municipalities, 47 district municipalities, 231 local municipalities and a number of district management areas (mainly conservation areas). However, the new demarcation has created as many problems as it has solved, and is one of the key problems experienced in terms of institutional sustainability. The main issues are the number of cross-border municipalities and district councils created, and the lack of clarity regarding the different roles and responsibilities of municipalities and district councils.

The Metropolitan Municipalities (Category A Municipalities) include:

- Johannesburg

- Tshwane (greater Pretoria)
- Ekurhuleni (East Rand)
- eThekwini (Durban)
- Nelson Mandela (greater Port Elizabeth)
- Cape Town

The breakdown of the local municipalities (Category B) per province is as follows:[12]

Province	Number of local municipalities	Number of cross-boundary local municipalities
Eastern Cape	38	
Free State	20	
Gauteng	7	1 with Mpumalanga 1 with North West
KwaZulu-Natal	50	
Mpumalanga	17	4 with Limpopo Province 1 with Gauteng
North West	21	2 with Northern Cape 1 with Gauteng
Northern Cape	24	2 with North West
Limpopo Province	22	4 with Mpumalanga
Western Cape	24	
Total	*223*	*8*

From this it is clear that there are 8 local municipalities that are located in two provinces. The same is also true of a number of district (Category C) municipalities.

Province	Number of district municipalities	Number of cross-boundary district municipalities
Eastern Cape	6	-
Free State	5	-
Gauteng	1	1 with North West,, 1 with Mpumalanga
KwaZulu-Natal	10	-
Mpumalanga	3	1 with Gauteng 2 with Limpopo Province
North West	4	1 with Gauteng 2 with Northern Cape
Northern Cape	3	2 with North West
Limpopo Province	4	2 with Mpumalanga
Western Cape	5	-
Total	*41*	*6*

Table : Distribution of district municipalities across provinces[13]

The location of local and district municipalities across provinces can lead to institutional problems related to access of provincial funds, disagreement between provinces with different political leadership, provincial responsibilities for these municipalities, etc. For example, if a municipality (as is the case with Tshwane) falls within two provinces, it has to apply to two provinces for housing funding, which is received from national government via provinces. Problems with boundaries and responsibilities can therefore contribute to a lack of institutional sustainability over the long run.

6.5.3. Financial capacity and viability

There are two aspects to the financial capacity of all spheres of government. The first is the availability of funding and the second the means of accessing and spending that money.

At national and provincial level the consistent under-spending of budgets shows that it is not the availability of funding that is the issue, but rather the processes of accessing and spending that money. Lack of capacity to manage the allocation and disbursement of funds is one obstacle; another is the complexity of funding mechanisms and the procedures of accessing these. A third is the failure to communicate the availability of certain funds, as well as the criteria and correct procedures for accessing these funds to the wider public.

At local level the problem is the availability of funding. While the idea of developmental local government is in line with sustainable development, there should be a realistic relationship between income (rates, taxes and equitable share of national income) and the expected delivery responsibilities of local authorities. Unfortunately, the mandates of developmental local government cannot be supported by the incomes of most local authorities. Payment levels are below targets and costs of services too expensive for many households, leaving local authorities with large arrears and sending over half of them into bankruptcy.

Due to the abolition of the homelands and the inclusion of rural areas within municipal boundaries, local governments are providing services to more people than they did in the past. However, they have had only marginal increases in revenue. In 1999 local government received about 0,5% of the national revenue, compared to

39% for provincial government, meaning that it had approximately 2% of its expenditure budget provided through revenue sharing, while provinces had about 95% covered by the equitable share. While the equitable share has since been increased, this is still not enough to provide adequately for the increased expenditure necessitated by the new functions demanded of developmental local government. The fact that the new municipal demarcation combines rural and urban areas means that municipalities in the poorer provinces have to divide their money amongst even more people, many of whom cannot contribute to the rates base.

Then there is also the question of whether local authorities actually have the capacity to spend the financing they require effectively.

Financial viability questions whether municipalities will receive some return on investment, or at least be able to recover their operational costs. Most municipalities act as the provider of services like water, sanitation and electricity, which they buy in bulk from the utility companies. This has traditionally been the main source of income for municipalities. However, the sheer numbers of people who are making use – in fact, demanding – these services, but who cannot pay for them or are using less than what is required to cover costs, is seriously threatening the financial viability of municipalities. For instance, Eskom calculated that a householder needs to use on average 400kWh/ month for the utility to break even on costs of connection, while newly electrified households use as little as 50kWh/month on average.[14] Johannesburg has found that the utility plan to provide basic access to residential areas in outlying regions, characterised by low usage and payment levels, as well as a complete absence of densification to support economies of scale, systematically undermines the sustainability of the city's basic utilities.

6.5.4 Operational efficiency

Operational efficiency is being hampered by several factors. Curbs on personnel expenditure since 1997/98 have eroded government capacity in general. The argument that a continued decline in personnel expenditure would free up resources for efficiency was based on a misunderstanding of the people-intensive nature of social services such as education, health and safety. It also underestimated the personnel requirements of managing the different government funding programmes. New legislation placed further demands on personnel, as the different spheres of government now had to approve a number of development plans (e.g. IDP, LED), and other requirements like environmental impact assessments, for which it had neither the skills nor the capacity.

At local level, operational efficiency is compromised by the confusion left in the wake of the municipal demarcation process. There is, as yet, no clear definition of roles and responsibilities between different spheres of government, especially between district municipalities and other municipalities. In cities like Buffalo City , which has suddenly become responsible for a number of rural settlements as well, there is no clear understanding of whether the municipality or the district is responsible for service delivery and maintenance in these areas. In other areas, already struggling municipalities are finding themselves burdened with even poorer small towns and rural settlements that contribute little to the revenue and skills base, but place an extra burden on the municipality.

In the smaller municipalities, like many in the Free State, the local authority simply does not have the skills to manage the IDP process. Training in the process alone is not enough to empower these municipalities. They also need skills in strategic planning, running public participation processes and an understanding of economics. For this reason, the IDP process is seen as far too complex by most local authorities, resulting in outsourcing and IDPs of dubious quality. One consultancy firm in the Free State was preparing the IDPs of nine municipalities. It would be impossible for it to provide a product of sufficient depth based on a thorough understanding of local conditions and community needs, given the time and resources available to prepare IDPs.

As for the other developmental aspects of local government, many local authorities

simply do not have the skills or the manpower to cope with these new responsibilities, and do not have the money to acquire them.

6.5.5 Technical capacity

Smaller municipalities and those in poorer provinces do not have the technical capacity to maintain existing infrastructure or manage the construction of new infrastructure, especially in areas that were previously under District Council control.

Most municipalities also have little knowledge of environmental management and more appropriate environmental technologies. They are used to delivering a standard bundle of services and are often resistant to new technologies that would require a change in regulations or procedures.

6.6 Conclusion

This chapter has shown that South African policies in general are very good and can compare with the best in the world. There is, however, concern around how policy is translated, introduced and implemented. At present there are no, or very few, mechanisms to make sure that national policy is taken up at provincial and local level and that lower-order regulations are changed to reflect this.

The most obvious institutional barriers include:

- the lack of integrated funding and planning at national level for settlement development;
- the lack of capacity within local government to manage strategic planning, as well as implementation, especially of more ecologically responsible development routes;
- the confusion resulting from the new demarcation process in terms of roles and responsibilities;
- the lack of effective incentives and disincentives for resource efficiency and pollution control for industry, residents and the commercial sector; and
- a commitment from government to strong sustainability.

Policies also extensively make use of jargon and often do not explain what is meant by it. There is often a gap in understanding between the vision statement of a policy (with all the requisite buzzwords) and the path suggested for the realisation of that vision. This gap suggests that that the policy makers themselves also do not fully understand the implications of the words they use. And while the introductory statements may present a strong sustainability approach, what follows in policy often tends towards a weak sustainability approach.

Lastly, the biggest gap is not necessarily in policy (the amount of policy and legislation is already daunting), but between policy and what happens on the ground. There is very little evidence that the utopian visions in the policy documents are actually being implemented at grassroots level, or translated in a way that supports sustainable settlement development. Perhaps what is needed is a consolidation of existing legislation and policy into a simple, easily understood policy framework, and an implementation plan that clearly delineates roles and responsibilities, explains the implications of the buzzwords, allows for access to integrated funding, and makes provision for a transition period which includes proper capacity-building before implementation is required.

[1] Pycroft, C. (2000) *From the Global to the Local: The Impact of Globalisation on Developmental Local Government.* Unpublished report prepared for the Development Bank of Southern Africa, Johannesburg.
[2] Louw, L. (1999) "Making Privatisation Work in South Africa." *Economic Reform Today*, Number 2, 1999.
[3] Landman, K. (2000) *An overview of enclosed neighbourhoods in South Africa*. Pretoria, CSIR Publication.
[4] This concept has even been taken further in South Africa where there is currently a growth of private security game estates, such as Molopa Village near the Kruger Park and Limpopo Village.
[5] Landman, K. (2002) "Gated Communities in South Africa: Building Bridges or Barriers." Proceedings: *International Conference on Private Urban Governance*, Mainz, Germany, June 5-9.
[6] Jourdan, P., K. Gordhan, D. Arkwright and G. de Beer (1996) "Spatial Development Initiatives (Development Corridors): Their Potential Contribution to Investment and Employment Creation" Working Paper, Development Bank of Southern Africa, Midrand, October.
[7] Naude, C. and McCoskey, S. (2000) "Spatial development initiatives and employment creation: Will they work?", Trade and Industrial Policy Secretariat, 2000 Annual Forum, September 2000.
[8] Smith, J (2000) *Spatial Development Initiatives Programme*. Unpublished Report, Development Bank of Southern Africa.
[9] Walker, M. (2001) "Resource-based Industrialisation Strategies: A Comparative Analysis of the South African and International Experience." *South African Geographical Journa*l (2001) 83 (2), pp. 93-104
[10] See also Appendix C.
[11] Du Plessis, C. and Napier, M.(2001) **"**Introducing Sustainable Development Into the Municipal Decision-Making Processes in South Africa – Is a Framework Possible?" *The Transformation to Sustainable Planning: Decision-making, Models and Tools* .29-31 August 2001, Newcastle upon Tyne, UK. University of Northumbria**.**
[12] A Broad Outline of the Demarcation Process. http://www.demarcation.co.za
[13] *ibid.*
[14] Energy Research Institute, *op cit*.

Chapter 7: Conclusions and recommendations

7.1 Introduction

Even though it only scratches the surface, this report illustrates the complexity of the sustainable settlement challenge. Not only is there a vast range of factors that have to be considered, but the requirements placed on settlement development by these factors are often contradictory. Similarly the choices to be made frequently have to rely on value judgements more than on hard and fast risk management and scientific analysis. There are also no simple recipes and checklists to assist the policy maker. The diversity of our settlements is so large that it is almost impossible to provide these kinds of checklists for similar settlement types in the same province and expect to see the same results.

It is necessary to realise that the different settlements that are described using the typologies need to be treated in different ways. Thus a solution that is appropriate in an urban environment may not be appropriate for rural settlements, or even in another type of urban environment. Contexts also vary in different parts of the country. However, there are certain normative principles that can be applied, as well as common challenges that have to be overcome. From these points of departure, the main tensions, threats and successes are discussed, and some recommendations for future policy development and further government actions have been made.

7.2 Tensions

Creating sustainable human settlements in South Africa takes place in an environment fraught with tensions between seemingly incompatible viewpoints. The challenge is to find the golden mean, or the optimum solution for each case that will cause the least harm and the maximum benefit. The following are some of the main areas of tension.

7.2.1 Equity versus efficiency

The RDP and the Constitution call for many basic needs to be considered as rights (interpreted as entitlements), whereas the Urban Development Strategy and subsequent policy tends to see them as commodities, to be provided only if the recipients could pay the full costs.[1] The more recent (post-RDP) approach of the state is to improve its efficiency by:

- removing itself from direct service delivery/provision of services;
- cutting the size of the state/ public sector; and
- cutting the state budget by cutting spending in the public sector and on welfare.

The delivery functions of the state then become opportunities for the private sector, which, it is hoped, will stimulate economic growth. However, the private sector has to operate according to the principles of the commercial market. Thus the tension is how to provide adequate standards of service to all, while being able to recover the costs incurred, and make a profit. This is related to the question of whether government efficiency should be measured in terms of economic efficiency (doing more with fewer people and resources), process efficiency (rate and quality of delivery), or service efficiency (delivering on its political mandate and constitutional obligations).

The question arises of how effective a driver of delivery in an economy the market is where almost 50% of the customer base lives under the poverty line and can hardly afford to pay for essential services. Under these circumstances, a purely market-driven approach would ultimately lead to the further marginalisation of people living in poverty. As an example, utility companies are beginning to feel the impact of HIV/Aids on their customer base and profit margins, and pressure from provincial governments is increasing (as illustrated recently in Nelspruit and the Dolphin Coast). Therefore a cause for concern is how long the private sector will be prepared to carry the responsibility of service delivery under these uncertain conditions.

A follow-on from this tension is the debate of whether government should continue to locate its investment where the people are (i.e. a kind of demand-driven delivery) or to encourage the movement of people to areas of higher economic potential. The challenge of the second approach is that

there needs to be a realistic calculation of the financial and environmental capacity of urban areas to absorb newcomers, as this capacity may eventually be exceeded. By concentrating investment in a few areas, the attractiveness of these areas is enhanced, and more people are likely to move to them in the hope of finding employment or at least a better standard of living. This then increases the need for housing, infrastructure and social services such as schools, clinics and emergency services in those localities. At some point the burden becomes too much for the local economy to support. Larger concentrations of people in settlements which follow the current patterns also place a larger burden on the environment.

The third aspect of this tension is how to ensure a basic lifeline service to all (in the spirit of equity), while making sure that people place a realistic value on the services provided. A lack of attributed value can lead to abuse of the services or an unwillingness to pay. The continued high levels of consumption of what appear to be cheap commodities (such as water and electricity) by more wealthy urban residents means that consumption is likely to exceed what is environmentally feasible.

Included in this is the question of whether people, particularly wealthier residents, should be permitted to use as much as they can afford, or whether the pricing policy should include the real environmental costs of the services, which might reduce consumption but place a larger burden on the poor if applied across the board.

7.2.2 Depth versus breadth

This is the dilemma of whether to deliver the most basic products quickly, at scale, to address the enormous backlogs wherever there is an identified need or deliver better-quality and more integrated environments at a slower pace in carefully selected areas.

Quicker development may lead to more people with access to basic housing, but possibly lower quality or smaller houses. It may also require more maintenance or upgrading of basic structures. On the other hand, more detailed planning for development, with a greater emphasis on quality, may lead to slower and lower rates of delivery, but may prove to be more sustainable in the long run. The assessment of quality relates not only to the basic infrastructure, but also to the quality of the settlement that is being created. A carefully planned approach will include proper urban design and the provision of services such as schools and clinics to coincide with the development of the housing component. It will also include a strategy for designing, managing and maintaining public spaces (including a variety of public spaces from green spaces to hard open spaces).

The point has been made elsewhere that there would be no need for the duality of quality versus quantity if the budgets for housing and infrastructure were to be increased.[2] In this scenario, it would be possible for both to be achieved.

7.2.3 Muddled roles and responsibilities

This tension arises from the fact that the three spheres of government operate independently in some respects, and are related hierarchically, which means that local government to a large extent is reliant on decisions made at national and provincial government. Add to this a district level government layer, as well as the overlapping of roles and responsibilities allocated to government by the Constitution, and a situation arises in which there is either fierce competition between the spheres of government, or complete inertia as each waits for the other to take responsibility for certain functions.

As national policy and legislation develops, it comes into conflict with existing regulations and bylaws at local government level, and sometimes even at national level. Currently any mechanisms that might be in place to ensure that these conflicts are resolved before the policy or legislation is formally accepted are not functioning effectively. The policy for urban densification is one example where local legislation can hamper the implementation of national policy. There are also disparities in terms of income division versus responsibilities between provincial and local government.

The notion of developmental local government as envisaged in the Constitution, and described in the *Local*

Government White Paper (1998), is based on the premise of the state playing a minimalist, managerial role. The direct delivery of services by municipalities is not seen as part of their core business. Government, including municipalities, is only to play an enabling role, leaving the actual delivery to the private sector through a variety of business structures such as public-private partnerships, joint ventures, etc. This approach is creating some confusion as to the real responsibilities of the different levels of government, or even the need for these different government tiers; as well as the relationship between the private sector (which is profit-driven) and the government (which should be people-driven).

Historically, municipalities were responsible for service delivery. Thus most of the senior officials, especially in smaller municipalities, are skilled in planning for implementation, but have weak skills in terms of strategy and analysis. This mismatch between skills and new responsibilities is creating further tensions within local government, as well as budgetary inefficiencies such as the necessity in under-capacitated local authorities to appoint consultants to prepare IDPs and other strategic plans.

The bottom line is that South Africa has three spheres of government (four if one includes the district municipalities), all responsible for strategy and policymaking, with four budget layers for infrastructure provision, and some confusion about who is responsible for delivery of what services and infrastructure, or the operation and maintenance of existing infrastructure. In some cases, there is also a lack of agreement in terms of the interpretation of policies describing the roles and responsibilities of various types of municipalities. For instance, it is not yet clear whether district municipalities are only supposed to play a coordinating function, or are to assume responsibility for the provision of bulk services (in especially rural areas) as well.

7.2.4 Expectations versus what is possible

In a country with limited natural and financial resources, those resources have to be very carefully allocated. This means that decisions regarding levels of service delivery have to be made within the context of what is ecologically and financially possible, rather than according to unrealistic expectations, short-term economic growth needs, or political expediency.

The main tension is between commercialised service delivery, where users are expected to pay the full costs of services with subsidisation being limited as far as is possible, and a more welfare-based approach based on the universal right to a certain level of service, irrespective of whether beneficiaries are able to pay for the full service or not. What has not yet been factored into this equation is the environmental feasibility and the real associated costs of high service levels such as full waterborne sanitation.

There is also a need for greater awareness amongst political office bearers on the implications and impacts of different service options. This would address the issue of unrealistic political promises leading to high public expectations which set up a series of tensions in trying to attain more sustainable settlements.

In projects where the implications and real costs of certain service delivery options have been explained to beneficiaries, people have often been prepared to accept a lower level of service delivery, or a more alternative technology option.[3]

7.3 Threats to the sustainability of settlements in South Africa

The factors outlined below represent some of the most critical threats to the sustainability of settlements in South Africa.

7.3.1 The empty tap

Arguably the most important environmental threat to settlements in South Africa is water scarcity. With less than 30 years left before demand exceeds supply, we can no longer afford to ignore this threat. While the country will not suddenly wake up one morning and find that there is no water in the tap, the tensions between different sectors are set to escalate as water is rationed and costs are increased. It is one of the areas where decisive action needs to be taken immediately, not just at settlement level, but also in industry and agriculture.

Introducing a sliding scale for water tariffs is a step in the right direction, but it needs to be supported by enforceable regulations for settlement development that encourage water savings and groundwater recharge, as well as an infrastructure repair and maintenance programme to minimise water loss through faulty infrastructure.

7.3.2 Cities of fear

As certain types of crime continue to grow, people become more fearful and more likely to protect themselves with strategies that make it more difficult for criminals to function. This approach can lead to increased levels of violent crime, which in turn call for a harsher response. Community coping mechanisms such as vigilantism, private security guards and street closures bring in turn their own pressures to the settlement. Eventually, personal freedoms may be the victim, as many of these measures inhibit democracy at constitutional, institutional and spatial levels, in that they lead to a physically segregated city and increasing gaps between the rich and the poor.

7.3.3 The Aids pandemic

One of the most threatening aspects of the Aids pandemic is that despite a great deal of work in various sectors, there is so little dependable information on which to base future planning. Three years ago in the State of Human Settlement Report the official statistics predicted a doubling of South Africa's population by 2035. Now the estimate is a peak of 47 million at 2010. These figures have very different implications for planning. Without accurate information about the extent of HIV/Aids infection, the planning decisions taken today are likely to be inappropriate for future settlement needs.

7.3.4 Growing poverty

The continued increases in levels of formal unemployment, a shrinking job market, and a growing young population (at least in the short term) all combine to increase poverty and inequality in South Africa. People experiencing poverty have difficulty paying for services and goods and therefore cut down on their average consumption. This impacts negatively on national and local revenue, the viability of local government and the profit margins of private service providers, as well as on economic growth, which in turn drives people further into poverty.

7.3.5 Leaping before looking

One of the biggest threats to sustainability is the tendency of government to act without properly considering the long-term implications of its actions, or fully exploring more sustainable alternatives. In its eagerness to transform the institutions of government, and to improve the quality of life of those who have been previously disadvantaged, some policy and implementation decisions have provided short-term solutions, but may have caused serious longer-term problems. The way in which mass housing has been supplied during the first five years of the housing subsidy scheme is a case in point.

In the haste to meet deadlines and delivery quotas, vast settlements have been created with inadequate planning and design inputs, and little coordination between the national departments responsible for providing social services such as schools, clinics and police stations, and the provincial departments of housing responsible for implementation of the housing policy. Far from providing a permanent solution to the housing crisis and urban poverty, another challenge has been created – how to attain adequate housing and viable settlements from the baseline of what has been initially constructed. The application of the cautionary principle could have led to the creation of settlement models that would have been more sustainable in every sense of the word.

A decision such as the fluoridisation of drinking water is another example of short-term thinking. In order to save R35 million/year in dental care costs, a decision was made that will increase the maintenance costs of infrastructure, possibly lead to soil degradation and may have increased future health costs, as well as make the government vulnerable to legal action.

The urgency to show delivery has also resulted in a gap between the provision of infrastructure, and providing a budget for its operation and maintenance. There are many examples of empty buildings and collapsed infrastructure projects, where the capital funding was provided without

sufficient planning for funding the staffing, equipment, running and maintenance costs.

7.3.6 Institutional complexity

The drive to establish legislation which is consistent with the principles of the new South Africa has led inevitably to a very large body of new policies, programmes, guidelines and complex mandatory procedures (such as the IDP process and various infrastructure plans). Some of the legislation produced is unintelligible to all except lawyers, and intricate funding processes contribute to a level of complexity that hampers effective development. While training programmes have been developed for some issues – such as IDP development – and laymen's guides have been prepared for some of the new legislation, there is still considerable confusion within local government.

The fragmentation of funding streams and lack of public communication regarding the availability, criteria and access processes for the different funding streams, is another problem. Trying to access funding for the creation of a new residential neighbourhood, especially one with mixed tenure, is akin to building a house with separate bonds for the bricks, the plumbing, the roof and the labour, and no money for coordinating and planning the bigger picture.

The complexity of the funding environment is partially to blame for under-spending by the different spheres of government. Processes for accessing funding, both for municipalities and for the private sector and NGOs, are unnecessarily complicated, and not very well communicated, meaning that provinces and national departments are unable to allocate all of their funding. Funding that was made available for local economic development and SMME development is similarly locked in by unnecessarily complex application forms and processes.

7.3.7 Underperformance and inefficiency

One of the major institutional threats in South Africa is a lack of efficiency in some parts of the public service sector. Much can be ascribed to the necessary processes of transforming and restructuring the public sector, but in the meantime effective delivery is being hampered, thereby contributing to many sustainability problems from badly performing educational systems to serious health risks due to the non-delivery of essential services. It also contributes to a loss of trust in local municipalities and a perception of weak local government that will not be able to provide efficient services in the future. This, in turn, contributes to the creation of levels of civil-based public administration (such as enclosed neighbourhoods, people's courts, vigilantism) which take up certain functions of government, and which may over the long term place additional pressures on human settlements in South Africa.

7.4 Successes

Although the barriers to the creation of more sustainable human settlements seem to be large, there has nevertheless been definite progress.

There is an increased awareness of the relationship between human settlements and their biophysical environment and the need for interventions in the way our settlements function so as to prevent damage to the environment.

An analysis of early government policy and more recent policies shows that there has been a tremendous advance in the understanding of sustainable development and how national policy can contribute. Recent programmes by the Department of Housing on environmentally friendly low-cost housing, green financing and a residential eco-rating system, as well as the commissioning of this study and others, shows that government is taking its commitment to the development of sustainable human settlements seriously.

The local authorities interviewed in the case studies all agreed that there is more integration at an institutional level, and that the need for integrated planning is more fully understood. Through the formation of bodies such as the Interdepartmental Task Team on Low Cost Housing, and the Interim National Council on the Implementation for Local Agenda 21 and the Habitat Agenda, this integration of planning and policy development is also starting to happen at national level.

While it is easy to criticise some aspects of housing and infrastructure delivery, the fact remains that quality of life has been improved for millions of people in the country.

While there are still some barriers to accessing the support provided by government, an enabling environment has been created that allows people and communities to help themselves. One of the major difficulties of development is that so much relies on individuals within specific settlements. A strongly motivated individual or group of individuals can often do far more to improve conditions than all the policy and legislation combined. Creating an enabling environment allows this most powerful of transformation forces to be fully realised.

7.5 Recommendations for future policy development

As explained in Chapter 6, South African policy does in general support sustainable development, and there are relatively few gaps. Most often, the biggest gap is not necessarily in policy (the amount of policy and legislation is already daunting), but between the envisioned outcome of policy and what happens on the ground. That said, there are some critical areas for policy revision.

7.5.1 Housing and human settlement policy

National housing policy is one of these areas. As has been demonstrated in this report, the way that the housing subsidy scheme and other infrastructure grants have until recently been implemented, has led to settlements which have harmful environmental impacts and weak support for more sustainable livelihoods. It would be timely for government to bring to bear the principles of a strong sustainability approach and to review its Constitutional mandate to enable access to adequate housing in this light. The key elements of such a new approach could be:

- A focus on creating liveable and sustainable settlements, thus shifting the emphasis away from meeting purely quantifiable housing delivery targets.
- Emphasis on ecologically responsible design and technology choices.
- Acceptance that we live in a highly mobile society, with people moving within cities, between cities, and between cities and rural areas throughout their lifetime. Any solution that traps people in one place will reduce their options for accessing employment and educational opportunities and, in effect, disempower them. This has implications for the way in which the subsidy is allocated to urban and rural households and the kinds of tenure attached to the housing produced.
- Acceptance that the nuclear family household is not the norm in South Africa, and that this will change even more radically due to the impact of Aids on family structures.
- Therefore, the investigation of a broader spectrum of housing options and designs. These can range from co-housing units for single-parent families, extended families or single people, to row-housing options and structures that allow for rooftop extension.
- Broader minimum-service delivery standards which encourage more sustainable technological options such as ecological sanitation.
- A rural settlement policy that focuses on creating self-sufficient settlements, which are less reliant on the cash economy, and a policy which uses modern technology to build on the strengths of tradition, not to replace traditional technologies.
- Building on the strengths of people's own efforts, in both urban and rural settlements, and adequate recognition of the value of settlement establishment processes initiated by communities with the greatest needs for housing.

These objectives can be achieved if the following institutional issues are addressed:

- Settlement planning that is integrated at both national and local levels, with coordination between at least the sectors of housing, transport, public works, energy, education, health, environment, and safety and security.
- Funding mechanisms that allow settlements to be developed holistically. This means funding that provides for the involvement of professionals such as urban designers and architects; a diversity of housing types, densities and tenures; and the

development of social and enabling infrastructure, public open spaces and economic opportunities at the same time as the development of housing.
- Consideration of both capital and operational costs in planning and funding allocation.
- A streamlined and integrated funding and implementation process with a balance between satisfying political imperatives and implementing environmentally responsible technical decisions.
- Top-down (national and provincial) decisions made on the basis of local level recommendations and requirements.
- Mechanisms to help people help themselves and for beneficiaries of state-assisted housing programmes to share some of the responsibilities of delivery and maintenance.

This may require that government takes back some of the responsibilities it ceded to the private sector, and that national government follows an integrated planning process for human settlements that promotes both vertical and horizontal integration, with an equally integrated financial planning process. The Special Integrated Presidential Projects programme and other existing programmes of government have the potential to supply many lessons that can be used to develop this kind of integrated planning.

7.5.2 Environmental policy

Another area that needs to be addressed is the body of policy and legislation which influences the interaction of human settlements and the biophysical environment.

Human settlement policy tends to focus on low-income settlements and how to address the “Brown Agenda” issues (as discussed in Chapter 2). The impact of human settlements has also been largely ignored in environmental policy, with the exception of construction and demolition waste management. Attention needs to be paid to the impacts of medium- and high-income settlements, with policy and regulations that will limit the consumption patterns of the suburbs and new residential areas, as well as commercial building, while allowing the use of more sustainable technologies. The development of such policy should be a collaborative process including, at the very least, the departments of Housing, Environment and Tourism, Energy, Transport and Water Affairs.

Furthermore, legislation protecting human settlements and ensuring the constitutional right to a safe and healthy environment is often weak, and provides few remedies for non-compliance. Taking recourse to the law is not usually an affordable option for affected communities or cash-strapped local authorities, and punitive measures are rarely strong enough to act as a deterrent. The focus on self-regulation is also an overtly optimistic approach (as discussed in Chapter 6), and needs to be supplemented with independent monitoring mechanisms.

7.6 Other recommendations

There are a number of other recommendations that are not directly related to policy development, but which are important to ensure the sustainability of our settlements.

7.6.1 Get the numbers right

The development of human settlements has long-term implications. It is impossible to plan for the needs of the next twenty or even ten years without more accurate data from which trends like urbanisation rates and infrastructure needs can be determined. Data on infrastructure delivery are collected in a piecemeal manner, with some done at national level, some at provincial level and some at local level, and often the figures conflict. While it is hoped that this type of information will become more accessible and coordinated through new database initiatives[4], the comprehensiveness and accuracy of the data remain a concern.

There is also very little data available on the success of infrastructure projects, For instance, how many people are still benefiting from rural water projects two years after project completion? Being connected to a service is not the same as actually being able to benefit from it, and this difference is often not measured. It is therefore crucial that government creates a regular and effective monitoring system of its infrastructure projects and their ability to continue delivering the service

and positive socio-economic impacts for which they were designed.

Critical data about the prevalence and impacts of HIV/Aids are crucial if sound planning is to improve sustainability.

7.6.2 Encourage innovation

As Einstein said, “No problem can be solved from the same consciousness that created it”. South Africa is unlikely to effectively solve its sustainability problems if it continues along the path that gave rise to many of the problems in the first place. This is particularly true for human settlement development. To develop a new path it is necessary to encourage and enable innovation and creativity of the highest order. This has to happen at several levels, from research and development of new technological and institutional enablers to the development of implementation mechanisms for these enablers, as well as regulatory mechanisms that enable the uptake of innovations.

South Africa spends only about 0,7% of its budget on research. The research budget managed by the Department of Arts, Culture, Science & Technology (DACST) through, for instance, the Innovation Fund and the Presidential Lead Projects, focuses almost exclusively on information technology, biotechnology and value addition/manufacturing. Research on the built environment and human settlements receives very little national funding support, yet this is the area where most of the national priorities are brought together, and it is where critical intervention is required if we are to achieve sustainability for South Africa. Unlike the research areas currently supported by DACST, it is also an area in which there is very little incentive for the private sector to fund research. If South Africa is to create sustainable human settlements, based on truly innovative and locally appropriate technologies and processes, it is necessary to start prioritising this in the allocation of R&D funding.

Some creativity is also required in the creation of a regulatory framework that encourages and supports innovation. The current regulatory environment provides a formidable barrier to the development and uptake of more ecologically responsible and appropriate technologies, thus discouraging innovation in this field. One part of the problem is the method used to determine standards for materials and technologies. Internationally there is a shift towards performance-based standards, instead of the traditional specification-based standards which are still the norm in South Africa. The latter were designed for a mechanised manufacturing environment, where conditions can be faithfully replicated. However, this approach is unsuitable for conditions such as those experienced in South Africa, where the emphasis should be on self-help and labour-intensive technologies. This effectively excludes many technologies which may attain better overall performances in terms of sustainability.

A further problem is that the current regulatory process requires a specific champion to request certification or the development of an SABS specification for a technology, and to bear the costs for this. For many traditional technologies there is no such champion because these are not patentable technologies and no one stands to make a profit from which the certification costs can be recovered. These problems further create the impression that these materials or technologies are somehow substandard, thereby hampering their acceptance by financing institutions, as well as by communities themselves. To solve this problem it is necessary to:

- revise the current National Building Regulations to include a broader spectrum of technologies;
- develop performance-based standards for construction and environmental technologies; and
- create a funding mechanism to fund the regulatory process for technologies that will contribute to a more sustainable built environment.

The third regulatory barrier that hampers innovation is the continued application of outdated planning regulations at local level. Many of these regulations were written for a society that no longer exists, and were the regulations that contributed to the current lack of urban sustainability. While a far more flexible regulatory environment should be the ultimate aim, a short-term goal should be to facilitate a process whereby local planning regulations are realigned with national settlement development policy.

Most importantly, it is necessary to nurture the spirit of innovation shown by the people of South Africa. Creating sustainable settlements often demands simple solutions that address many issues simultaneously. As has been illustrated by the Ugu Municipality in KwaZulu-Natal, the IDP process can be used very successfully to unlock this creativity, helping communities to develop their own sustainable solutions to local problems. However, this requires an open and transparent process, as well as open minds on the part of the community, their political leaders, the technocrats within the municipal system, and design professions.

7.6.3 Lead by example

By far the most effective way to ensure that sustainable development becomes an integral part of settlement creation would be for government to lead by example. This would imply that the ways in which government conducts its affairs (e.g. managing its own assets) should reflect the same principles of sustainability that they are seeking to build into civil processes.

7.6.4 Take a holistic view

When it comes to promoting resource efficiency, the impact of industry and agriculture needs to be taken into account as well, and a holistic approach followed. Often it is easier for industry to reduce its energy and water use than to change entire settlements. Integrating agriculture into the urban environment can also reduce the impact of climate change on the country's food security, and ensure better use of resources such as water, land and the nutrients in urban waste. In the case of urban agriculture, care should just be taken as to where and how it is implemented, so as to add to the sustainability of human settlements and not to cause additional problems if implemented randomly and without proper thought as to the location, type of produce, purpose of produce, maintenance of crops, etc.

7.7 Conclusions

It should be recognised that difficult decisions will be necessary, and decision-makers will at times be forced to choose between two evils without always being clear which will be the lesser. Making these choices will be easier if national government makes two decisions up front:

1) Is it going to continue with its weak sustainability approach or shift to a strong sustainability approach?
2) Is it aiming for people-centred development, or will it allow market forces to undermine some of the benefits of such an approach?

The approach that government chooses will largely determine the future sustainability of human settlements in South Africa.

One suggestion would be not to be too prescriptive. At national and provincial level, roles and responsibilities need to be as clear as possible, information needs to be widely available and people (decision-makers and communities) should be given the tools to understand the requirements of sustainable development and to use these as the main guidelines for planning and implementation.

Local level interventions aimed at the creation of more sustainable settlements should follow a strategic but connected approach. Interventions have to be strategic in that the focus is on the priority needs of the community, as identified by themselves, and how these needs can be optimally addressed with the limited resources available to local government in South Africa. However, these interventions will not contribute to sustainability if cognisance is not taken of the project's relationship to the wider network of needs (including the needs of marginalised groups), its place in the broader planning context, its linkages to existing infrastructure, its acceptability by the prevailing culture, its affordability for both the local authority and the beneficiary, and its impact on the local and global environment.[5]

Settlements will only be sustainable once the values of sustainability have become the basis from which the majority of decisions on the creation and management of settlements are made.

[1] Bond, P. (2002) *The Degeneration of Urban Policy after Apartheid*. Unpublished paper.

[2] Bond, P. (2000) *Cities of Gold: Townships of Coal.* African World Press: Trenton.
[3] Napier, M., *et al*. (2001) *Environmental Technologies in South Africa: Pathways towards Sustainable Innovation in Human Settlements.* Pretoria: CSIR Report BOU/c339. Available online at: http://www.lead.csir.co.za
[4] For example, the PIMSS database and its successor IDEA 2002.
[5] Du Plessis, C. and Napier, M. (2002) *Implementing Appropriate, Innovative Technologies in Low Cost and Informal Urban Settlements*. Pretoria: CSIR Report BOUc/359.

Appendix A: Indicators corresponding to Habitat Agenda

List of indicators corresponding to the 20 Habitat Agenda key areas of commitment[1]

CHAPTER 1: Shelter

1. Provide security of tenure
- indicator 1: tenure types
- indicator 2: evictions

2. Promote the right to adequate housing
- qualitative data 1: housing rights
- indicator 3: housing price-to-income ratio

3. Provide equal access to land
- indicator 4: land price-to-income ratio

4. Promote equal access to credit
- indicator 5: mortgage and non-mortgage

5. Promote access to basic services
- indicator 6: access to water
- indicator 7: household connections

CHAPTER 2: Social development and eradication of poverty

6. Provide equal opportunities for a safe and healthy life
- indicator 8: under-five mortality
- indicator 9: crime rates
- qualitative date 2: urban violence

7. Promote social integration and support disadvantaged groups
- indicator 10: poor households

8. Promote gender equality in human settlements development
- indicator 11: female-male gaps

CHAPTER 3: Environmental management

9. Promote geographically balanced settlement structures
- indicator 12: urban population growth

10. Manage supply and demand for water in an effective manner
- indicator 13: water consumption
- indicator 14: price of water

11. Reduce urban pollution
- indicator 15: air pollution
- indicator 16: wastewater treated
- indicator 17: solid waste disposal

12. Prevent disasters and rebuild settlements
- qualitative data 3: disaster prevention and mitigation instruments

13. Promote effective and environmentally sound transportation system
- indicator 18: travel time
- indicator 19: transport modes

14. Support mechanisms to prepare and implement local environmental plans and local Agenda 21 initiatives
- qualitative data 4: local environmental plans

CHAPTER 4: Economic development

15. Strengthen small and micro-enterprises, particularly those developed by women
- indicator 20: informal employment

16. Encourage public-private sector partnership and stimulate productive employment opportunities
- qualitative data 5: public-private partnership
- indicator 21: city product
- indicator 22: unemployment

CHAPTER 5: Governance

17. Promote decentralisation and strengthen local authorities
- qualitative data 6: level of decentralisation

18. Encourage and support participation and civic engagement
- qualitative data 7: citizen involvement in major planning decisions

19. Ensure transparent, accountable and efficient governance of towns, cities and metropolitan areas
- qualitative data 8: transparency and accountability
- indicator 23: local government revenue and expenditures

CHAPTER 6: International cooperation

20. Enhance international cooperation and partnerships
- qualitative data 9: engagement in international cooperation

Appendix B: Main drivers and pressures influencing the sustainability of human settlements in South Africa

1. Introduction

The current state of settlements in South Africa was described in Chapter 5. This section discusses in more detail some of the main drivers that influence human settlement development and the sustainability of settlements in the country. These drivers or external forces for change place certain pressures on settlements. The responses to these pressures can, in turn, become new drivers (see Chapter 6). There is often not a clear linear cause-effect relationship between drivers, pressures, impacts and responses. Instead, the relationship is a systemic one with both reinforcing and balancing feedback loops.

An example of a reinforcing feedback loop is where a number of drivers such as poverty, demographic change and globalisation combine to create the pressure of crime. Some of the responses to crime, for example target hardening, then cause an escalation in violent crime such as hijackings and armed robbery, This can increase the fear of crime and lead to more intensive and extensive responses. Some of these responses may lead to social and economic exclusion, which may contribute to poverty and hardship at a household level and a lack of investor confidence at national level. This increases other pressures and the magnitude of drivers such as poverty, driving more people to a life of crime, and eventually crime itself becomes a major driver.

The drivers can be loosely grouped in four categories:

1. *Social drivers,* such as demographic change, the need to establish equity, crime and HIV/Aids.
2. *Socio-economic drivers,* such as the effects of poverty, the need for economic growth, urbanisation, and globalisation.
3. *Environmental drivers,* such as limited natural resources and environmental hazards.
4. *Policy drivers* such as the measures taken to provide for basic needs, macroeconomic policy, and local government restructuring. Policy drivers tend to be responses to the pressures caused by the previous drivers, but are causing considerable pressures of their own (Chapter 6).

All of these drivers also have an impact on the spatial transformation of South African cities. Table 1 at the end of this appendix provides an overview of the main drivers, pressures, impacts and responses influencing the sustainability of human settlements in South Africa. A short narrative description of each of the main drivers follows below. It must be noted that this section only highlights some of the main drivers and pressures. It would be impossible to provide a full overview of the myriad influences determining the sustainability of a settlement and their complex relationships. As such there are definitely factors that have been overlooked or not considered in adequate detail.

2. Demographic change

Population growth is no longer seen as a main pressure for South Africa. The country already has a growth rate that is comparable to that of a developed country, with the lowest fertility rates in Africa (2,9 births per woman). The impact of Aids is slowing down population growth even further and it is estimated that population growth will reach a peak of 47 million in 2010 under a best-case scenario. Under the worst-case scenario, the population will peak at 46,7 million in 2008, and have slightly negative growth thereafter.[2] This radical turnaround in expected population growth is already impacting on the feasibility of service delivery. For example, in Durban Umgeni Water provided infrastructure based on assumptions of continued population growth. The utility company has now been forced to increase prices as lower than expected population growth has also resulted in lower than expected consumption and therefore reduced income and lower profit for the company.

There is also clear evidence of a changing age pattern with an increase in the number of young adult deaths relative to deaths at older ages. In addition, more females are dying. The mortality rate in the 25-29 age range in females in 1999/2000 was 3,5 times higher than in 1985.[3]

However, the country has a very youthful population with more than 45% of the population under the age of 20. This means that even with an anticipated negative population growth rate, the pressure to

provide housing, municipal services and jobs will continue to escalate for the next decade at least, as these youngsters become adults with households of their own.

Rural poverty, the social legacy of apartheid and the struggle against it, as well as post-1994 government policy and legislation such as land tenure reform and the housing subsidy, are also responsible for a changed demographic profile in rural and urban communities.

Although migration patterns differ from town to town, there are certain commonalities. The largely urban provinces of Gauteng and the Western Cape experiences net gains in population, while the more rural provinces are experiencing net losses. The motivating force behind this movement of people is the search for employment opportunities. Many small towns are experiencing population growth as farm workers migrate to nearby towns, either because they are being pushed off farms, or are moving to town to capitalise on the housing subsidy. However, cities like Durban are seeing a movement to the rural areas on the edges of Durban – both from other parts of the province and from Durban itself. These areas offer lower service costs, and the opportunities for livelihoods derived from the natural resources base, as well as from the city.[4]

Persistently high out-migration of the economically active population in rural areas has left these areas with disproportionately large numbers of children, elderly and households headed by women, and a deficit of young men.

Persistent circular migration patterns and other social factors are in turn causing a change in household structure. The traditional nuclear family is not the norm in South Africa. Many children do not live in the same household as their parents. Children are also sent to live with rural grandparents or family members, as single parents cannot provide adequate supervision, and few support structures for childcare are available to dual-income poor households. Where children are living with a parent, 42% of children under the age of seven live only with their mother. Economic circumstances and significant in-migration to cities and towns are also causing increased population density as extended families are squeezing into homes designed for a nuclear family and income is earned through the letting of backyard shacks. This may exacerbate social problems as evidenced by the high rates of domestic violence, rape and child abuse.

3. Crime

Levels of recorded crime have been increasing since the mid 1980s in South Africa and more dramatically since 1994. While levels of crime are high in South Africa, crime does not affect all people uniformly. The likelihood of people being victimised is influenced by his/her age, income, place of residence or work, circle of friends, etc. Young, poor, township residents are at the greatest risk of becoming victims of interpersonal violent crimes, while middle-aged, wealthy suburban residents have a far greater than average risk of being victims of serious property crimes. The risk of violent crimes aimed at property such as armed robbery and car hijacking is fairly evenly distributed throughout the population[5].

There are a number of factors contributing to the high crime rate in South Africa. These are poverty, unequal distribution of wealth and the second largest income disparities in the world, the spread of HIV/Aids, a culture of violence, a youthful population, the transition from an authoritarian regime to a democracy, rapid urbanisation, the proliferation of firearms, organised crime, a weak criminal justice system, and the inherited spatial patterns of the apartheid city.

Some explanations for the high rate of violent crime refer to South Africa's political history and a culture of violence that accompanied the struggle for freedom. Families suffered from "institutional violence" for decades through the disruption of their lives by the mass removals and migrant labour policies of apartheid. Political violence compounded this disruption of family life. This resulted in the weakening of the family unit and thus parental control over children, which may prompt criminal behaviour among the youth.[6] This culture manifests itself in the quick resort of people in this country to violence as a means for solving conflict or to achieve specific aims.[7] The level of violence also contributes to more extensive responses in the built environment.

South Africa is but one of a number of countries that experienced political transition in the last decade or two. Other countries include several in Latin America, such as Brazil, Chile, Argentina, Peru, the former communist regimes of Eastern and Central

Europe (for example Russia, Ukraine and Poland) and other African countries such as Nigeria and Mozambique. Along with dramatic political transition, many of these have experienced social, economic and spatial transition as well. Comparisons of the links between these transitions and the growth of crime have indicated remarkable links between political transition, rising levels of crime, and social, economic and spatial changes in cities.[8] Some of these changes included growing levels of crime accompanied by a range of responses to address the problem. These responses or their causes are some of the pressures of crime on the settlement. The spatial changes are often a reaction or resistance to change. Defensible architecture and urbanism is one such a response, which can have a significant implication for human settlements. Another is the establishment of vigilante groups or increased use of private security to control urban spaces.

The pressures that crime places on settlements cannot be seen in isolation. The high levels of violent crime (resulting in part from organised crime and gang culture) combine with high levels of property crime to increase fear of crime, which in turn leads to urban fortification where urban communities barricade themselves from the rest of the city. The impacts of violent crime and property crime lead to loss of household income, increased security costs and worsen the socio-economic conditions of poor households which have been victimised. This, in turn, contributes to one of crime's major causes – poverty. The fear, psychological trauma, high stress levels and social exclusion created through urban fortification in turn contribute to a more segregated and aggressive society.

Crime impacts on the built environment through both physical and sociological changes. As fear of crime rises, people start to use their settlements differently, which means that entire sections of the settlement, such as public open space, public transport and certain commercial sectors are avoided and ultimately collapse. Fortification (high walls, razor wire, etc.) and an increased internalisation of social activities (such as shopping centres) lead to urban decay, as no one takes responsibility for the space outside the borders of their immediate environment. Other fortification measures, such as enclosed neighbourhoods, alter the movement patterns of the city, obstruct emergency access and place an unplanned burden on infrastructure such as roads.

It is likely that organised crime syndicates are behind a significant number of car hijackings, vehicle thefts, armed robberies (especially cash-in-transit and bank robberies), burglaries of homes in higher income areas and businesses, commercial crimes and even certain types of shoplifting. While no accurate figures exist, it is likely that organised crime has grown considerably in South Africa since 1994[9]. This pressure often leads to urban fortification on different scales, from buildings to entire neighbourhoods. While it is argued that these attempts may reduce opportunistic crime, many are of the opinion that it often fails to address crime by syndicates.

High crime rates often lead to an increased need for the police and more police stations in cities, to reduce the radius of police station areas. This would arguably lead to quicker response times. High crime rates also lead to increased pressures on health facilities due to an larger number of victims, especially over weekends and festive seasons. It also places more pressure on the welfare system as many of the crime victims are left disabled.

Crime also places increased pressure on local councils to address aspects of the built environment that contribute to opportunities for crime, such as dark alleys and subways, vacant, overgrown areas (especially in traditional townships), illegal shebeens, improper or no signage, a lack of lighting, etc.

The impact of crime in the country cannot be over-emphasised. It has a huge impact on the creation of sustainable human settlements and, at it most extreme, it threatens to dismantle the process towards greater democracy.

4. HIV/Aids

Recent demographic work estimates that by 2015 deaths from Aids-related causes will have grown to more than 10 million. The Medical Research Council recently released a report that places Aids as the single biggest cause of death in South Africa.[10] In Johannesburg, 60% of deaths reported annually in the city are from HIV/Aids-related causes. It is predicted that by 2008, overall life expectancy in South Africa will have fallen to 40 years.[11] These figures were calculated at an infection rate of 20%, which is the current national estimate. However, there are

indications that the infection rate may be significantly higher.

The long delays between infection and death also mean that behaviour change now will only begin to reduce the number of Aids-related deaths in about five years, with the full effect lagging by a decade or more, making long-term planning even more difficult.

However, the economic impact of Aids could be substantial. Taking a 20% infection rate, simulations of an Aids versus a Non-Aids scenario shows a GDP level in 2010 that is 17% lower in the Aids scenario and a per capita drop in GDP of around 8%. This will leave the survivors of the Aids epidemic with a smaller economic "pie" and more of this "pie" will be directed towards health and food expenditure, so that discretionary expenditures decline dramatically.[12]

Determining the impact of Aids on human settlements is hampered by the fact that there is are no reliable statistics about infection and death rates. There are, however, studies that show that HIV infection rates differ in different settlement types, with an estimated 21% infection rate among people living in private houses to 36% among those living in informal settlements.[13]

One of the main pressures Aids will place on society is the expected increase in orphans. By 2005, it is expected that there will be around 800 000 orphans under the age of 15, rising to 1,95 million in 2010. Many orphans will grow up as street children or will form child-headed households. Others will be brought up by grandparents with limited capacity to take on parenting responsibilities. As children grow up in the pressurised circumstances of losing parents to Aids, without adequate parenting, support and opportunities, they are at high risk of developing antisocial behaviour and of becoming less productive members of society. They may also be more susceptible to becoming HIV-infected through abuse, sex work and emotional instability leading to high-risk behaviour.[14]

Another pressure is the loss of productive workforce. Incidence of HIV/Aids among workers will reduce labour productivity. It will also lower total factor productivity due to absenteeism and high turnover rates, which means increased spending on training and recruitment. This also means that, while there is more pressure on government for health spending, the tax base is actually decreasing. Similarly there will be a drop in household income, reducing the ability of households to provide for their own needs.

As Aids predominantly affects those in the age group 25-45, which also is the main economically active group, sickness and death in this group will cause a loss of household income and a shift in spending towards health and funeral costs. It will also cause changed expenditure patterns, sales of assets such as housing, and lower investment in human capital (e.g. education of children).

While it is uncertain to what an extent Aids will change human settlement patterns, it is already starting to place pressures on land use planning through an increased demand for cemeteries. The steady increase in adult mortality rates is contributing to cemeteries in many urban areas rapidly reaching their capacity, placing a further financial burden on local authorities. Buffalo City estimates that it will have to spend R16 billion on developing new cemeteries over the next ten to fifteen years. In Johannesburg, the pressure for cemeteries has seen a rapid growth in "black-market" cemeteries as owners of agricultural holdings are selling burial plots on an informal basis. Apart from further reducing critical agricultural land in Gauteng, this last response can hold serious health hazards.

In cities like Durban and East London, the topography place limits on land available for burial sites. As those pockets of land suitable for burial are usually also in demand for other activities, such as settlement development and agriculture, and thus of high value, the increased demand for cemeteries is placing further economic burdens on the local authorities, while hampering the well-planned growth of urban areas.

5. Establishing equity

One of the key challenges facing South Africa is overcoming the inequities of the past, providing a fair and just society and creating equal opportunities for all. To this end it is important to break past patterns that disadvantaged large sectors of society. Establishing equity has therefore become a major driver placing pressure on all sectors of society to reform.

In a society with a history of deep racial division, the most important pressure is to establish equity between the different race groups. In the same vein, there is a need for

greater gender equity, as well as the provision of equal opportunities for people living with disabilities. The need for equity has placed pressure on business and social structures such as sport, culture and educational institutions to employ affirmative-action policies to make their membership more representative of South Africa's demographic profile.

While the position of women is steadily improving and the country has one of the most gender-balanced governments in the world, women are still worse off than men in terms of education, employment and pay, and discriminated against in terms of customary law. The greatest economic inequality is also found between male- and female-headed households. Female-headed households in rural areas still form the most impoverished sector of the population.

However, the inequity of the past is also deeply rooted in the spatial patterns of our settlements, both within settlements (the typical apartheid city pattern) and the artificial location of settlements (e.g. "betterment" settlements and homeland settlements). A major pressure is to remove the inequalities in terms of service delivery and access to opportunities found between the historical (black) townships and (white) suburbs, and to integrate settlements both spatially and at institutional level. Recent legislation on municipal structures and the demarcation of municipalities was promulgated with the purpose of integrating settlements at an institutional level, although this is not yet fully happening in practice.

6. Poverty

South Africa has the second-highest inequality coefficient in the world. In South Africa the poorest 10% of the population receives only 1,4% of the total income, while the richest 10% receives 47, 3 % of the total income.[15]

While the inequality of income between races is considerable, inequality within race groups is also substantial. Poverty places many pressures on a society. People living in poverty are more vulnerable to diseases due to poor nutrition and food insecurity, exposure to indoor air pollution from fires used for cooking and heating, lack of adequate sanitation and clean drinking water and inaccessibility of health care.

People living in poverty also tend to have less access to education and low skills levels, which prevent them from fully participating in the modern economy and society. Internationally, there is a shift from labour-based occupations to knowledge-based occupations that further marginalise people living in poverty. Access to a rapidly changing and often increasingly specialised job market is also problematic and increases the gap between the rich and the poor.

Poverty and the unequal distribution of wealth is one of the main reasons for crime, although not the only one as explained in the introduction. Crime also disproportionately targets the poor, thus exacerbating the effects of poverty. It further causes change in the urban fabric as the way people use their settlements changes. An example in South Africa is where residents are closing off entire neighbourhoods, completely changing the urban structure and movement patterns, and often increasing social exclusion.

Municipalities are faced with the challenging task of providing urban services to wealthy and poor people while maintaining their own liquidity. The drive to alleviate poverty further gives rise to some of the other main drivers such as the need for increased economic growth, urbanisation and most of the policy drivers. There is also a relationship between the drivers of poverty, Aids, demographic change, establishing equity and the environmental drivers.

7. Pursuit of economic growth

South Africa is in a double bind where it aims to become a competitive global economic player, while addressing the mammoth task of uplifting the bulk of the population and redressing past socio-economic imbalances. While the strategy that has been followed since 1994 has seen an increase in the economic growth rate, this has not translated into job opportunities for South Africans. The much-hoped for trickle-down effect of economic growth is therefore not happening.

Despite population growth, there has been a decline in the number of jobs from 5,2 million in 1996 to 4,8 million in 1999. The negative performance of the formal sector in creating employment could be attributed to, amongst other things, the pressure exerted on domestic private-sector producers for higher real wages in an unfavourable international economic environment. The private sector opts for more capital-intensive production

methods whilst reducing its work force. The move in Government to improve the efficiency of its public service by reducing the wage bill also has a negative effect on employment creation. Declining international commodity prices, especially of gold, and the expansion of subcontracting and outwork in a number of economic sectors, has further reduced formal employment.

This means that the areas in which South Africa's large percentage of relatively uneducated workers could find work – mining, agriculture and domestic service – are steadily shedding employment opportunities. On the other hand, there are skills shortages in the fields of science and technology, as well as middle management. There is therefore a pressure on South Africans to bring their skills into line with market needs.

Local economic development is seen as one way of stimulating economic growth and job creation, and stimulating local economic development has become a major pressure for local authorities. However, there are growing concerns about the way local economic development is approached. It is assumed that conventional approaches will automatically benefit the poor through increased economic opportunities and jobs. However, this assumption is false, as across the world there is evidence that dynamic economic growth can occur without creating any new jobs.[16] Economic growth does not equate to poverty alleviation, and in fact strong economic growth can be accompanied by increasing inequality and poverty if it is focused on a few sectors and involves technologies that benefit small groups of people.[17] The challenge is, therefore, to establish a model more closely aligned with the principles of local economic development (LED) that emphasises the importance of working directly with low-income communities, as opposed to the orthodox macroeconomic approach that focuses on attracting investment through incentives such as tax breaks or cheap land.

The successful implementation of initiatives stimulating economic growth through local economic development necessitates a productive and efficient public sector to provide the required support and regulation. The "new" South Africa has inherited an unwieldy and inefficient civil service which is still in the process of transformation. Political transformation has also brought tensions between the old and new guard within the public sector. There is therefore tremendous pressure to streamline the civil service at all levels of government, while providing a more efficient service.

Finally, economic growth requires supporting infrastructure such as water, electricity, roads and communications technology. This is required not only for large commercial undertakings, but also for small businesses and home-based enterprises, in urban as well as rural areas. Current minimum service levels, especially of water and electricity, prevent the establishment of many types of home-based businesses. A lack of electricity for cooling and inadequate transport (including roads) prevent small rural farms from bringing their produce to nearby markets. The need for increased economic growth therefore places pressure on government to provide infrastructure that supports local economic development and enables local businesses to expand their markets.

8. Globalisation

The rise of the global economy is associated with the growing integration of production and markets of different countries. This was largely made possible by telecommunications and other technological improvements that have enabled economic activities to be connected without having to be in close proximity and to operate across time zones.[18]

Globalisation offers people the opportunity to improve the quality of their lives through increased trade and financial integration among countries, lower communication and transport costs and technological change. However, these opportunities are mainly available to those people who are highly educated or have highly developed skills and access to well-functioning labour and capital markets. South Africa's challenge has been to ensure that the marginalised parts of the community are included in this process.[19]

One result of globalisation is the increasing competition between cities for investment. Sassen[20] narrows globalisation's impact down to three types of sites in cities where global processes are embedded, namely production zones, tourism centres and major business and financial centres. In South Africa, cities (and rural settlements) are positioning themselves to compete in one or all of these areas. The development of Industrial Development Zones and Export Processing Zones in areas like Coega (Nelson Mandela

Metropole), Saldanha, and Buffalo City, is trying to provide favourable production zones for export-orientated business. In its 2030 Vision, Johannesburg plans to be competitive as a major business and financial centre. Finally, tourism is seen as an easy way of capitalising on the shrinking global village. In the case studies undertaken for this project, tourism has been voiced as a possible driver for local economic development by every single case study, and is included in the IDPs of most local authorities, regardless of its viability and the possible social and environmental impacts.

Globalisation has placed pressure on our macroeconomic policy development, as is evidenced by the Growth, Employment and Redistribution (Gear) policy of national government, the economic policies of the Reserve Bank and the semi-privatisation of infrastructure and service delivery. However, the question must be asked whether the alignment of local policies with certain international positions will be to the benefit of ordinary South Africans, especially the marginalised sectors of society.

Crucial to becoming part of the much vaunted "global village" is access to telecommunications and especially the Internet. The vast majority of the population in South Africa does not have ready access to a telephone, let alone have the facilities for Internet access. As a web presence is becoming increasingly important for all businesses, including small tourist facilities in rural areas, the pressure is on service providers to make modern telecommunications more accessible to all South Africans. The need to become a part of the networked society also places pressure on the Department of Education and other education services to improve computer and language skills.

Becoming a member of the global society brings with it certain responsibilities as well. South Africa is under pressure to participate in international conventions such as those on climate change, biodiversity and fair labour practices, and to play a leading role in peacekeeping and the development of Africa. Meeting global responsibilities may mean that resources are sometimes diverted from fulfilling local responsibilities.

9. Urbanisation

The majority of the world's population now lives in cities, and urbanisation is a global driver of development. Estimates from the 1996 Census places 54,1% of South Africa's population in urban areas. This figure may be more as many people who are living in resettlement areas are classified as rural, while their environment is decidedly urban. Gauteng is the most urbanised province (97% of people living in urban areas), followed by Western Cape (88,9%) and Northern Cape (70,1%). Limpopo Province has the largest rural population (89%), followed by North West (65,1%) and Eastern Cape (63,4%).

Following on the rapid urbanisation of the 1980s and early 1990s, it appears that urbanisation is slowing down. The October Household Survey figures between 1996 and 1999 do not show a significant increase in the urban population, with the number of urban residents having decreased slightly from 54,1% to 53,9% in that time. Provinces like Gauteng are actually showing decreased population (from 97% down to 96,5%), but the differences are not statistically significant, and the October Household Survey is not an accurate indicator of urbanisation. The urbanisation trend will only become clear from the Census 2001 figures. However, despite a relatively stable urban population, the footprint of cities continues to grow. This is mainly a result of internal dynamics. The Housing Subsidy has allowed many people living in backyard shacks or sharing accommodation to move into their own homes, and a young population means that the number of households increase as children grow up and set up homes for themselves.

Urbanisation concentrates and thus compounds the environmental impact of human settlements. Increased water run-off leading to higher flood risks and pollution of groundwater, increased water consumption due to higher standards of services, increased concentrations of air and water pollutants, and the degradation or complete loss of arable land and biodiversity, are but a few of the environmental impacts of urbanisation.

Where urbanisation is coupled with high levels of unemployment and poverty, as in South Africa, additional pressures are placed on the biophysical environment, society, and the local government of the city or town in question.

Crime rates worldwide are higher in cities than in rural areas, with the rate generally

increasing according to city size. Most factors associated with high crime rates characterise cities to a greater extent than small towns. Population density, for example, is thought to be associated with crime in situations of poor-quality built environment and poverty, in that greater concentrations of people lead to competition for limited resources, greater stress and increased conflict. Factors which characterise urbanisation, such as overcrowding, unemployment and increased consumer demands and expectations, are themselves believed to be associated with high crime rates. High levels of gang activity and the availability of firearms are also mainly evident in urban areas and are known to be related to criminal activity.[21]

In South Africa urbanisation is also coupled with low-density development and urban sprawl. This results in increased transport needs and high service delivery costs and infrastructure demand. Other historical factors, such as migrant labour practices, have placed additional pressures on rural areas as the able-bodied migrate to urban areas in search of employment, leaving only the very young and the old in rural areas.

10. Limited natural resources

The way human settlements develop cannot be disassociated from the surrounding natural environment and its resource base. One way of measuring a settlement's environmental impact is by measuring the ecological footprint of its inhabitants. The ecological footprint is the amount of ecologically productive space that is required on a permanent basis to produce all consumed resources and to absorb all the wastes produced by the settlement. The combined ecological footprint for South Africans has been calculated as 4,3 ha per capita. The available global footprint is 1.8 ha, which means that South Africa's footprint is more than twice what it should be to ensure the sustainable use of natural resources.

The main pressures the environment places on the development of human settlements in South Africa relates to the scarcity of two natural resources: water and arable land.

Most of South Africa's settlements were established at harbours or on mineral deposits, with the result that they do not have sufficient water to support continued growth. Climate change is predicted to further reduce the amount of water available, while pollution from industries, urban run-off, informal settlements, and inadequate wastewater treatment is polluting dams, rivers and groundwater. This creates water stress in urban areas and tensions between urban and rural users of water.

A very small percentage of South Africa's land surface is arable. Soil erosion in dense rural settlements in the previous homelands, urban sprawl, and construction practices in the cities are major contributors to the loss of arable land. This reduces rural livelihoods and can eventually compromise national food security. Soil erosion also contributes to the siltation of dams and rivers, which further contributes to the water crisis.

South African settlements are also very inefficient in terms of energy use. Globally, there are two reasons for more energy efficiency. The first is global climate change, and internationally governments and the private sector are pressurised to reduce greenhouse gas emissions. South Africa, with its mainly fossil fuel-based energy, and high per capita levels of emissions, is particularly vulnerable to increased pressure in this regard. The second reason is the declining availability of fossil fuels and the relatively high costs of renewable sources of energy.

11. Environmental hazards

Settlements also place certain pressures on the environment, which in turn creates pressures on the settlement. For example, the high levels of indoor air pollution lead to health problems, which have cost and productivity implications, which in turn reduces the municipality's ability to put measures in place that will reduce air pollution. The same cycle can be described for the pressures created by lack of access to clean water, sanitation and waste management.

Natural and man-made disasters place another set of pressures on local government not only to respond timeously to disasters but, more importantly, to put measures in place that will reduce the incidence of disasters such as floods and fires (see also Chapter 5,"Vulnerability to disasters").

12. Conclusion

The factors which place pressure on people and on settlements are diverse. While it is necessary to track the well-known factors such as demographic and economic factors, it is also essential to identify previously

unrecognised or under-estimated factors. A clear example, which has only recently been accorded proper recognition, is the impact that the spread of HIV/Aids is having on society and its institutions. However, the whole range of factors needs to be continually and responsibly monitored so that current planning is not based on outdated assumptions.

The new lens that has been applied in this report is the impact that these factors have not only on human settlements and societies, but on the biophysical environment which represents for humanity the means of survival at both local and global level.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
Demographic change	Skewed age profile	52% of the population is under twenty. More than half of those under twenty are found in rural areas. Economically active population concentrated in urban areas.	Need for youth-centred infrastructure and development programmes. Increase in housing need as the young population matures and set up own households. Need for other housing alternatives such as rental housing to accommodate influx of young people from rural to urban areas.	Housing subsidy programme shift in focus to urban areas. Sports development programmes. Skills development strategy. Johannesburg Housing Strategy backyard shack improvement programme. White Paper on Population Policy.
	Migration (internal)	Circular migration pattern of economically active population moving to urban areas, and then moving back to rural areas after retirement. Migration following temporary job opportunities created by large infrastructure projects (e.g. Mossgas, Coega, Work for Water, Lesotho Highlands Water Project). Rural-rural migration following perceived housing opportunities.	Skewed age profile in rural and urban areas. Increased urbanisation. Complicated planning for infrastructure delivery and determining housing need. Creation of dynamic settlements that are difficult to plan for, and where people have no roots. Influx of unemployed people into areas where there is temporary work opportunities far exceeds the ability of these opportunities to absorb the newcomers. Resettlement of people in marginal areas. Increased and concentrated generation of pollution and waste.	Increased housing and infrastructure delivery. The Integrated Sustainable Rural Development Strategy. Local Economic Development Programmes.
	Changing household structures	In urban areas more single-person/single-parent households. Younger, more mobile households.	Need for a variety of housing types and tenure types. Increased sprawl.	Urban focus on development policies. Urban growth boundaries (Johannesburg). Social and rental housing programmes.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
Crime	Organised crime and gang culture	Relaxation of travel controls and participation in the world economy has created an opportunity for international crime syndicates. Trans-national crime. Dysfunctional family units. Youthful society with few opportunities. Imported cultural role models (e.g. rape, drug abuse, etc.).	Escalation of violent crime. Xenophobia. Extensive urban fortification.	National Crime Prevention Strategy. White Paper on Safety and Security. Restructuring of the Justice System . Community Safety. Programmes such as neighbourhood watch groups. Community Police Forums (CPFs) and Sector policing. Special Investigation Units (e.g. Scorpions). Business Against Crime initiatives. Business Improvement Districts (BIDs). City Improvement Districts (CIDs). Private Security Industry Levies Bill. Safe Deposit of Securities Amendment Act, 1996. Private Security Industry Regulation Act, 2001.. A number of policies on road closures at local government level.
	High levels of violent crime	A third of all reported crimes of a violent nature. Proliferation of firearms, especially in urban areas. Culture of violence. Weakening of family unit.	Higher number of disabilities. Loss of household income. Psychological trauma and high stress levels. Fear of crime.	
	Fear of crime	Urban fortification. Mistrust between groups (economic and race) hampering transformation. Increased “talk of crime”. Stigmatisation of certain groups .	Vigilantism. Artificial living patterns. Growth of private security industry. Privatisation of urban space. Proliferation of firearms	
	High property crime	High levels of poverty and economic inequity. Weak criminal justice system provides little deterrent.	Urban fortification. High insurance costs placing extra burden on household income. Extreme vulnerability of the poor means property crime can tip households into indigence. Loss in investor confidence, especially in inner city areas.	

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Urban fortification	Closing-off existing neighbourhoods, even illegally in some cases. Development of security villages and estates. Increased efforts to secure property such as perimeter fencing, installation of alarms, CCTV cameras, burglar bars, etc.	Social exclusion. Target hardening, often leading to an increase in violence of crime (hijacking, armed robbery). Privatisation of public urban space through enclosed neighbourhoods. Proliferation of security villages, often leading to increased privatisation of services as well. Proliferation of shopping malls controlled by private security. Urban fragmentation and separation.	
Aids	Aids orphans	Increase in child-headed households and street children. Insufficient care facilities. Increased burden on the elderly.	Lack of moral guidance for next generation. Pressure to become involved in crime as a survival strategy. Change in family structure. Need for care facilities. Extreme poverty.	Aids Policy. Community care programmes. Aids Action Plan. NGO and privately run shelters and care facilities. Clinics Building and Upgrading Programme (CBUP). Basic childcare grant. White Paper on the Transformation of the Health System of South Africa.
	Loss of productive workforce	Reduction in economically active workforce. Reduced productivity. Skills loss.	Decreased household income and tax base, but an increased social burden. Reduced competitiveness. Shortage of crucial skills.	Aids Action Plan. Skills Development Strategy (indirect).

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Loss of household income	Increased health spending. High funeral costs. Increased burden on economically inactive household members (children and elderly).	Extreme poverty. Decrease in quality of life. Inability to pay for services. Increased household debt levels. Increased burden on public health sector.	White Paper on the Transformation of the Health System of South Africa. Basic childcare grant.
	Increased demand for cemeteries	Above-average mortality rate. Cultural norms that require burial.	Increased costs for local authorities. Permanent loss of arable and developable land. Increased competition with other sectors (development & agriculture) increasing land prices and thus burial costs.	Boom in illegal and unregulated cemeteries.
Establishing equity	Gender equity	Gender equity in South Africa still behind rest of Africa and Asia. Lack of skills on gender-sensitive project implementation.	Drive for gender-sensitive projects. Conflict in cultural set-up in rural villages. Empowerment of women.	Gender policy in DWAF. Quota system on water committees in Water Act. Gender streamlining in Department of Health. Commission for Gender Equity. Research grants for research in gender issues.
	Affirmative action	Workforce profile not a reflection of demographic profile.	Restructuring of government and private sector organisations.	Employment Equity Act.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Breaking apartheid city patterns	Initiatives for integration established at institutional level. Current development continues spatial pattern of separation, fragmentation and low-density sprawl.	Integration is gradually happening at many levels. More equitable distribution of resources. Improved access to opportunities for all.	Development Facilitation Act. Urban Development Framework. Urban Renewal Strategy. White Paper on Spatial Planning and Land Use Management. Municipal Structures Act. Municipal Systems Act. Municipal Demarcation Act.
	Disability access	Low employment rates for the disabled. Mobility and accessibility problems. Institutional barriers to accessing disability grants.	Poverty. Burden on family. Difficulties in collecting disability grants. Low employment. Marginalisation of people living with disabilities.	Employment Equity Act. Disability Grant. Transport White Paper. Housing Subsidy Top-up Fund.
Poverty	Vulnerability to disease	Burning of wood, coal and dung causing indoor air pollution.	High incidence of respiratory tract infections.	Electrification programme.
		Lack of adequate clean water and sanitation.	Diarrhoeal diseases a major health problem. Outbreak of cholera epidemics.	Water and Sanitation Programme. Lifeline water provision.
		Overcrowding.	Higher risk for TB and other infectious diseases. Social problems such as domestic violence and child abuse.	Housing Subsidy. Programme. Social Housing Programme.
		Food insecurity.	Malnutrition. Lowered immune response increasing vulnerability to HIV and other diseases. Lower productivity. Lower childhood development.	School Nutrition Programme. Urban agriculture programmes (NGO sector). Integrated Sustainable Rural Development Strategy.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Inadequate education	Still high illiteracy rates, though improving.	Inability to fully participate in modern economy and society.	Adult Basic Education and Training Programme.
		Skills mismatch.	Unemployment and skills shortages in specific areas (e.g. science and maths teachers).	Skills Development Fund.
	Crime	See full discussion under crime as a driver		
	Inability to pay for services	High service arrears.	Local authorities in financial problems. Evictions from subsidy housing.	Pre-paid meters. Lifeline service provision. Increased equitable share for local government.
		The poor are not receiving the full benefit of initiatives meant to improve their quality of life.	Increased vulnerability to disease. Housing subsidy beneficiaries selling or renting their houses and returning to informal settlements.	
Pursuit of economic growth	Job creation and skills building	Skills mismatch. Overall lack of skills. Continued job losses and lack of employment opportunities. Unrealistic expectations of young job seekers.	Demand for labour-intensive projects and industries. Inappropriate skills development not in line with local needs. Unsustainable job creation (temporary jobs). Crime seen as an acceptable avenue to meet income aspirations. Negative environmental pressures if job creation is unregulated. Improved socio-economic status may create increased consumerism.	Skills Development Strategy. Skills transfer and capacity-building as part of procurement criteria for government projects. Short-term job creation programmes such as Work for Water.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Local economic development	Lack of a local economic growth base and/or opportunities. Lack of local opportunities for sustainable livelihoods. Weak understanding of local economic development at local authority level. Narrow definitions of economic growth potential	Artificial migration and private sector investment patterns. Unsustainable/ inappropriate projects Focus on only a few economic drivers (tourism, industrialisation) making settlements vulnerable to changes in world economics. Increased pressure on environmental resources.	Local Economic Development Programmes at national and local level. Developmental local government.
	Productivity and efficiency	Inheritance of inefficient civil service. Low morale in public service sector (esp. police, health and education).	Privatisation of services. “Rightsizing” of civil service which leads to loss of capacity and deterioration of services. Rise in unemployment.	Restructuring of government and civil service Public-private Partnerships.
	Infrastructure provision	Lack of adequate enabling infrastructure (e.g. roads, telecommunications, electricity) both in rural areas and in pockets of underdevelopment in urban areas.	Overburdening of infrastructure in some areas. Marginalisation of large sectors of society. Barriers to entrepreneurial activities. Increased pressure on environmental resources.	Privatisation of service providers (e/g/ telecommunications). CMIP.
		Mismatch between where people (and therefore needs) are and where economic growth opportunities are.	High commuter rates, thus need for transport. Need for strategic allocation of resources and infrastructure investment. Danger that some areas will become further marginalised as investment is focused in areas where there is already high investment and therefore an economic growth base.	National Spatial Development Plan. Spatial Development Initiatives. Urban Corridor Programme.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
Globalisation	Integration with global markets	Neoliberal economic policy driving government service delivery . Competition between cities at global level.	Focus on global competitiveness at the expense of local needs. Increased vulnerability to currency fluctuations and international economic pressures. Jobless economic growth leading to increased inequity.	Gear. Urban Development Strategy. SDIs, IDZs and Development Corridors.
	Fuelling the tourism industry	Exponential growth in tourism infrastructure development. Excellent tourism potential.	Creating awareness of environmental and cultural conservation. Boosting national self-esteem. Tourism increasingly seen as a blanket solution for rural development because of some success stories. Unrealistic expectations about the long-term sustainability of international tourism. Environmental modification and degradation. Social problems (e.g. increase in child prostitution, drug trade, etc.).	Tourism White Paper, 1996. Tourism Development Fund.
	Joining the networked society	South Africa's ICT infrastructure best in Africa and internationally comparable. High uptake of cellular phone technology. Access to global networks like Internet still concentrated in the hands of the affluent.	Access to world market for small business, especially those in the tourism industry. Increased connectivity for areas that were previously under serviced. Increasing divide between First and Third World components of the country.	Privatisation of communications infrastructure.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Regional and global responsibilities	South Africa seen as an economic and political leader in Africa and as playing a leading role internationally (SADAC, Commonwealth, NAM, NEPAD, etc.). Major contributor to global climate change.	Opened up development opportunities. Greater awareness of environmental problems. Burden on our resources (both financial and high-level leadership). Reporting to UN is stimulating regular policy review and sustainable development internally.	Signatory to various international agreements and protocols. NEPAD. Implementation of Local Agenda 21 programmes. Reporting to UN (UNCHS and CSD). Peacekeeping and conflict resolution in Africa.
Urbanisation	Urban-rural tensions	Urban bias in government spending Urban – rural linkages such as remittances, circular migration and commuting. High costs of living in rural areas for similar services to those offered in urban areas. High entry-level costs in urban areas and less choice on service levels than in rural areas.	Increasing rural poverty and marginalisation of rural areas. Skewed demographic profile in rural areas.	Urban Development Framework. Rural Development Framework. Urban Renewal Strategy. Integrated Sustainable Rural Development Strategy. Spatial Development Initiatives. National Spatial Development Plan.
	Increased concentration of the environmental impact of human settlements	Demands for higher levels of services.	Increased water demand. Higher pollution levels. Increased pressure on arable land and natural heritage.	
	Urban sprawl and low density development	Low density residential development encouraged by housing subsidy system. Increased densification in middle-class housing.	Creation of edge cities High service delivery costs and infrastructure demand. Increased transport needs.	

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
Limited natural resources	Water scarcity	Water demand exceeding supply by 2030. No relationship between location of development and water sources. Unsustainable water-supply systems.	Severe water stress in urbanised provinces. Reduction in rural livelihoods. Increased tension about distribution of water. Need for severe water conservation measures.	National Water Act. Water demand management systems. Lifeline water supply. Funding for community participation and capacity building for rural water projects.
	Loss of arable land	Extremely high rates of topsoil loss and severe erosion in parts of the country. Drop in per capita food production as a result of land degradation. Urban sprawl reducing high and medium potential agricultural land.	Loss of rural livelihoods. Compromised national food security. Siltation of dams and rivers increasing the water crisis. Desertification leading to local climate change.	Environmental Impact Assessments. Urban growth boundaries.
	Efficient energy use	Very low energy efficiency. High dependency on fossil fuels. High residential use of fuel wood . High levels of indoor air pollution.	Global climate change. Deforestation around settlements leading to soil erosion, floods, etc. Increased health risks.	Climate Change Discussion Document. White Paper on National Energy Policy.
Environmental hazards	Pollution	High levels of air pollution, both indoor and ambient.	Increased health risks. Deterioration of built environment. Acid rain degrading arable land and forests. Pressure for clean production and renewable energy.	White Paper on Integrated Pollution and Waste Management. Integrated Environmental Management Policy. National Environmental Management Act.
	Access to clean water	Households, schools and hospitals still without access to clean water. High levels of groundwater and surface water pollution.	Increased health risks.	National Water Act. The Water Services Act. Water Services Development Plans (part of IDPs). Lifeline water provision.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Adequate sanitation and waste management	Health and hygiene levels very low. Sanitation implementation not co-ordinated among relevant departments. Inappropriate technologies. No spending on sanitation budgets due to lack of co-ordination and capacity. Illegal and badly managed dump sites and landfills.	Accelerated drive for sanitation projects. Increased health risks and health burden. Sanitation backlog increasing. Groundwater pollution.	White Paper on Basic Household Sanitation. Framework for a National Sanitation Strategy. National Sanitation Co-ordination Strategy. Sanitation Task Teams at Provincial level. National Waste Management White Paper.
	Prevention and mitigation of disasters	Informal settlements and townships particularly vulnerable to a range of natural and man-made disasters. Low disaster-preparedness in all spheres of government .	Destruction of assets that cannot be replaced by their owners. Loss of infrastructure. Poverty.	White Paper on Disaster Management.
Meeting basic needs	Meeting quantitative targets	Delivery of more than one million houses. Vastly improved access to services in both urban and rural areas.	Low quality housing. Lack of integrated planning between housing and infrastructure and social services creating low quality settlements. Creation of unrealistic expectations and culture of entitlement.	RDP Integrated Sustainable Rural Development Strategy. Water Services Act. Municipal Infrastructure Investment Framework. The Housing White Paper. The Housing Act. National Norms and Standards. National Housing Code.
	Affordability	Free housing for the poorest of the poor but services unaffordable for many. Free lifeline water provision, with planned free electricity lifeline. Subsidy amount did not cover costs of minimum norms and standards required, leading to reduced quality of housing.	People selling their subsidy house, thus losing the asset. Non-payment of services leading to municipal bankruptcy or service cut-offs and civil unrest. Low durability of housing and services provided.	

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Land redistribution, restitution and tenure reform	People displaced from their land due to discriminatory laws in SA. Disadvantaged people struggling to access financial assistance to buy land. A plethora of laws dealing with land development inherited from the apartheid government, many which have not been replaced yet.	Hate and distrust between different groups of people. A lack of security of tenure for many farm workers and rural dwellers. Displacement of farm workers to small towns, resulting in unsustainable growth for these towns.	The Bill of Rights/ The White Paper on Land Policy in South Africa/ The Restitution of Land Rights Act, 22 of 1994/ The Provision of Certain Land for Settlement Act, 126 of 1993. The Development Facilitation Act, 67 of 1995 . The Upgrading of Land Tenure Rights Act, 2 of 1993. The Land Administration Act, 2 of 1995. The Land Reform (Labour Tenants) Act, 3 of 1996. The Interim Protection of Informal Land Rights. The Land Redistribution Programme. The Land Restitution Programme. The Land Tenure Reform Programme. Extension of Security of Tenure Act

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
Macro-economic Policy	Privatisation and partnerships for service delivery	Lack of capacity within local governments to adequately deal with service delivery. Increased reliance of state on private sector partnership for delivery. Slow progress at national and local level.	Privatisation of utility companies. Privatisation of service delivery (some aspects) in large residential security villages. Proliferation of private security. Growth of CIDs and BIDs. Establishment of micro-urban governments. Threat to sustainability of some completed schemes. Some delays in planned infrastructure delivery. Loss of interest by potential investors and operators.	Municipal Service Partnership Policy Framework. Municipal Infrastructure Investment Unit. COSATU/SALGA agreement on job security for municipal workers. Private Security Industry Levies Bill. Safe Deposit of Securities Amendment Act, 1996. Private Security Industry Regulation Act, 2001.
	Privatisation of urban space	High levels of crime. International market trends. Social and economic control. Territorial governance.	Escalation of Enclosed neighbourhoods. Increased development of peripheral shopping malls and “country estates”. Growth of private security industry.	A number of policies on road closures at local government level. Chapter 7 of the Rationalisation of Local Government Affairs Act, No 10, 1998. Private Security Industry Levies Bill. Safe Deposit of Securities Amendment Act, 1996. Private Security Industry Regulation Act, 2001.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Spatial infrastructure investment	Infrastructure delivery concentrated in target areas. Increased investment in enabling infrastructure. High capital costs and low number of jobs created relative to cost. Emphasis on resource-based industrialisation.	Opened up new geographical areas for investment. Creates local expectations. Stimulates in-migration from non-targeted areas. Increased environmental burden. Marginalises excluded areas and caused job losses in industrial development zones set up under the previous regime.	The Urban Development Strategy. White Paper on Local Government. Development Facilitation Act. White Paper on Spatial Planning and Land Use Management. White Paper on Environmental Management Policy. Municipal Infrastructure Investment Framework.
Local government restructuring	Municipal transformation	Confusion about roles and responsibilities of different spheres of government. Low morale. Restructuring fatigue. Insufficient skills and capacity. Resistance to change. Rural and urban areas combined in one municipality.	Better integration between communities separated through apartheid planning, and increased cross-subsidisation from the affluent to the poor. Increased strategic planning burden on under-capacitated local authorities. Larger financial burden on local authorities with inclusion of rural areas. Improved urban-rural integration. Weak local government. Institutional inefficiency. Slow delivery. Increased financial burden on local authorities. Slow turnaround times for decision-making.	White Paper on Local Government. Municipal Structures Act. Municipal Systems Act. White Paper on the transformation of public service delivery. Municipal Infrastructure Investment Framework. Increased equitable share.

Table 1 Drivers, Pressure, State, Impact, Response summary				
Driver	**Pressure**	**State**	**Impact**	**Response**
	Integrated development planning	Entrenched sectoral-based thinking and bureaucratic procedures. Lack of skills to manage the participatory process. Inability of smaller municipalities to do strategic planning. Complexity daunting for underskilled local authorities. Lack of integrated planning (and funding) between different spheres of government and barriers against integration such as different funding cycles.	Increased awareness of the need to integrate planning, and in some cases actually improved integration between line departments. IDPs are being prepared by outside consultants, resulting in weak institutional support for programmes and inappropriate IDPs	Municipal Infrastructure Investment Framework. Municipal Systems Act IDP Manuals and training programmes.
	Developmental local government	Lack of capacity, skills and funds. Narrowly focused economic development models.	Overburdened municipalities. Inefficient delivery. Slow turnaround times. Inappropriate development programmes. Emphasis on delivery quotas prohibit more innovative delivery options such as using sweat equity to stretch funding.	Municipal Infrastructure Investment Framework. Local Economic Development policy.

Appendix C: Policy review

1. Introduction

Chapter 6 discussed the policy pressures and responses as they applied to sustainability issues in human settlements. In addition to the argument presented in Chapter 6, the identification of policy strengths and weaknesses was also based on the following more comprehensive review of a wide range of policy areas which are spread over many different government departments.

2. Non-departmental policies

In Chapter 6 several pieces of legislation and policy which spanned departments were reviewed, including the Constitution, the RDP and GEAR. One remaining policy which falls into the same category is the Urban Development Strategy.

2.1 The Urban Development Strategy (1995)

In 1995, the government of national unity released a discussion document, namely the Urban Development Strategy, to invite comment from various role-players in terms of an urban development strategy for South Africa. This document was developed to ensure the future sustainable development of both urban and rural areas in the country.

The document highlighted major challenges for urban development and proposed an urban vision and strategic goals to guide urban development in a new direction. At that stage the government's vision was that, by 2020, cities and towns in South Africa should be:

- based on integrated urban and rural development strategies;
- leaders of a globally competitive national economy;
- centres of social and economic opportunity for all;
- free of racial segregation and gender discrimination;
- managed by accountable, democratic local governments;
- planned in highly participative fashion;
- marked by good infrastructure and services for all;
- integrated centres which provide access to many physical and social resources; and
- environmentally sustainable.

In order to achieve this, the strategy outlined seven strategic goals:

- to create efficient and productive cities with less poverty and sustained by dynamic economies;
- to reduce existing infrastructure and service disparities;
- to provide better housing and shelter and greater security of tenure for urban residents;
- to encourage affordable growth of local economies;
- to tackle spatial inefficiencies, especially the mismatch between where people live and work to improve the quality of the urban environment;
- to transform local authorities into effective and accountable local government institutions; and
- to establish safe and secure living environments.

From the vision and goals, it appears that urban sustainability was still very much seen as environmental (with a focus on the natural environment). However, despite its attention to environmental sustainability, the strategy omitted leading arguments regarding urban sustainability and was far out of line with progressive international urban environmental thinking. The document did not address the relationship between human settlements and their ecological context in terms of sustainability of the bio-physical beyond "impact analysis".[22]

Some of the other aspects highlight important issues for urban sustainability in a holistic way. However, it is not clear from these whether the impact of globalisation – and what increased competitiveness between cities would mean for poverty alleviation and upgrading of disadvantaged areas at a local level – had been thought through at that stage.

The document also considered urban and rural development in an integrated way. Despite this initial intention, it was redrafted in 1997 into two separated frameworks by the Department of Housing, namely the Urban Development Framework and the Rural Development Framework.

3. Department of Housing

There are four primary national housing frameworks or policies that should be reviewed in terms of sustainable development:

1. The Housing White Paper (1994)
2. The Housing Act (1997)
3. The Urban Development Framework (1997)
4. The Rural Development Framework (1997)

In general, two common themes can be identified in South African Housing Policy, namely adequate shelter for all, and sustainable human settlement development.[23] The policies are further supported through a number of housing programmes and support institutions.

3.1 The Housing White Paper (1994)

This paper sets out the government's broad housing policy and strategy. The intention of this paper is to establish viable, socially and economically integrated communities, situated in areas allowing convenient access to economic opportunities as well as health, educational and social amenities, within which all South Africans will have access on a progressive basis, to:

- a permanent residential structure with secure tenure, ensuring privacy and providing adequate protection against the elements; and
- potable water, adequate sanitary facilities including waste disposal and domestic electricity supply.

The White Paper details seven strategies to implement this intention. These strategies have evolved since 1994 and have been implemented in the country. They are:

1. Stabilising the housing environment.
2. Mobilising housing credit.
3. Providing subsidy assistance.
4. Supporting the People's Housing Process.
5. Rationalising institutional capacity
6. Facilitating speedy release and servicing of land.
7. Coordinating government investment in development.

There is a wide range of policy initiatives, Acts and institutions that have been created and are being implemented in terms of these strategies.

Since the introduction of the National Housing Subsidy Programme in 1995, it has evolved into a comprehensive policy instrument providing an array of housing opportunities to a broad spectrum of eligible households. The programme now allows for a range of tenure options in both urban and rural areas. It can be applied on an individual or on a collective/cooperative basis, for the refurbishment of old housing stock (including the upgrading of informal settlements), or the production of new dwelling units. Institutional subsidies cater for rental as well as other tenure options, such as private ownership.

The subsidy amounts have also been increased in 2002 to allow more realistic assistance.

It has often been questioned whether the provision of a housing subsidy to the poor is sustainable or, in other words, whether it will contribute to the creation of sustainable human settlements.

On the one hand, it can be argued that the poor have been forced to live in disadvantaged areas and therefore need to be assisted to improve their living conditions. In this way a house can become an asset that could be used as collateral or as a means to achieve an income. The house, therefore, provides its inhabitants with a means to achieve an improved quality of life, which in turn contributes to the creation of more sustainable human settlements. A problem however occurs when residents cannot pay for their services and are then evicted from their houses, losing not only their place of residence, but a major economic asset.

On the other hand, it may not be economically sustainable to provide subsidies on a continuous basis for an indefinite period of time, due to limited financial resources and the anticipated need resulting from a young population. In this case, it could be more appropriate to supply residents with supporting infrastructure (services and social facilities) and perhaps the bottom structure for a house and leave it to residents to build their own houses through assistance from housing support programmes. There are no clear-cut answers and the large number of uncertainties in SA do not help the search for answers. Whatever the case, it cannot be denied that housing is one of the crucial elements of a sustainable settlement and that government should play a leading role in assisting people, through the most appropriate method, to get access to housing, as well as in defining the

nature of basic housing. The Housing Act has gone a long way to do just that.

Yet, despite some positive spin-offs, Bond (2002) argues that, instead of becoming more actively involved to help the poor, the government is standing back. The Housing White Paper adopts a more market-centred approach, which has several unfortunate outcomes for low-income housing, including:

- an inequitable allocation of funding between different low-income groups;
- a low rate of delivery;
- the deconstruction of existing housing construction capacity;
- communities being displaced;
- a reluctance on the part of the private sector developers to be involved in conflict-ridden areas; and
- the reproduction of apartheid-style ghettos.[24]

3.2 The Housing Act (1997)

The Housing Act, Act 107 of 1997, defines the housing development functions of national, provincial and local governments, repeals all racially based housing legislation, expands on the provisions of the Constitution and prescribes general principles for housing development. The Housing Act contains the following key provisions:

- the establishment of appropriate norms and standards;
- the allocation of funds to the provinces for the financing of the housing programmes;
- the management of assets, liabilities, rights and obligations; and
- the management of housing information.

It builds on the Housing White Paper and summarises some of its thinking. The Housing Act promises, in its "general principles applicable to housing development", that the various levels of government will:

- "encourage", "support" and "assist" individuals and communities in meeting their own housing needs;
- give priority to "the needs of the poor" and "the meeting of special housing needs" particularly the needs of the disabled;
- "consult meaningfully with individuals and communities" and "facilitate active participation of all relevant stakeholders";
- ensure that there is choice of housing and tenure types; and
- ensure that there is no unfair discrimination in housing development or in access to housing benefits, and that housing development is "economically, fiscally, socially and financially affordable and sustainable".

Housing development should achieve integration (integrated development planning and urban-rural integration) as well as "the elimination of slums and slum conditions". Government commits itself to intervene to promote the "effective functioning of the housing market while levelling the playing fields and taking steps to achieve equitable access for all to that market" (Housing Act, 1997).

These principles demonstrate that government has taken on an enablement role, rather than being the provider of housing or, at the other extreme, leaving provision solely to the market, thus strengthening its market-centred approach to housing delivery as stated in the Housing White Paper. In the process of performing this enablement role towards adequate housing for all, government commits itself to establishing and maintaining "socially and economically viable communities and … safe and healthy living conditions" in which there can be "the expression of cultural identity and diversity". Attaining higher densities of housing and the provision of community and recreational facilities would also be priorities.[25]

However, it remains to be seen whether a role of enablement will be enough to ensure the establishment of sustainable human settlements. Can housing provision be left solely to the market? Will this ensure adequate and affordable shelter for all? It is difficult to say but, given our tradition of underdevelopment in certain areas, it does appear to call for increased government involvement and assistance (at least for the time being) to those living in disadvantaged areas, in order to upgrade these areas to an acceptable level. The Housing Act seems to support this notion of upgrading and improvement of the quality of life while at the same time emphasising the enabling role of government and thus stepping back to let others take control of the situation in many cases.

3.3 The Urban Development Framework (1997)

This document was the result of a redrafting of the Urban Development Strategy, while incorporating comments as far as possible. The Urban Development Framework incorporates the government's vision for

sustainable urban settlements. It also outlines guidelines and programmes for the achievement of this vision. This document was released by the Department of Housing in 1997 as the main policy guideline for the implementation of the Habitat Agenda in South Africa.

The Urban Vision framed in the Urban Development Framework incorporates a more holistic understanding of sustainable development as outlined in the Habitat Agenda, and this is reflected in the way its vision has evolved from the vision outlined two years earlier, both in understanding and elaboration. The vision entails that, by 2020, all cities and towns in South Africa should be:

- spatially and socio-economically integrated, free of racial and gender discrimination and segregation, enabling people to make residential and employment choices to pursue their ideals;
- centres of economic and social opportunity where people can live and work in a safe, healthy and peaceful environment;
- centres of vibrant urban governance, managed by democratic, efficient, sustainable and accountable metropolitan and local governments in close co-operation with civil society and geared towards innovative community-led development;
- environmentally sustainable, marked by a balance between a quality-built environment and open space, as well as a balance between consumption needs and renewable and non-renewable resources -- sustainable development, therefore, meets the needs of the present while not compromising the needs of future generations;
- planned in a highly participatory fashion that promotes the integration and sustainability of urban environments;
- marked by adequate housing and infrastructure and effective services that provide households and business a basis for equitable standards of living;
- integrated industrial, commercial, residential, information, health, educational and recreational centres, which provide easy access to a range of urban resources. and
- financed by government subsidies and by mobilising additional resources through partnerships, by more forcefully tapping capital markets, and by employing innovative off-budget methods.

In order to implement this vision, the urban development framework outlines four key programmes:

- **Integrating the city,** which aims to negate apartheid-induced segregation, fragmentation and inequality. The focus is on integrated planning, rebuilding and upgrading the townships and informal settlements, planning for higher density land use and developments, reforming the urban land and planning system, urban transportation and environmental management.
- **Improving housing and infrastructure** involves the upgrading and construction of housing, restoring and extending infrastructure, alleviating environmental health hazards, encouraging investment, increasing access to finance and social development, building habitable and safe communities, maintaining safety and security.
- **Promoting urban economic development** aims to enhance the capacity of urban areas to build on local strengths to generate greater local economic activity, to achieve sustainability, to alleviate urban poverty, to increase access to informal economic opportunities and to maximise the direct employment opportunities and the multiplier effect of implementing development programmes.
- **Creating institutions for delivery** requires significant transformation and capacity-building of government at all levels and clarity on the roles and responsibilities of the different government spheres. This will also encompass a range of institutions, including civil society and the private sector, and require significant co-operation and co-ordination among all of them.

Together, the four key elements start to frame a more holistic approach towards sustainable development, highlighting different aspects such as spatial sustainability (through a more compact city); social sustainability (through adequate and affordable shelter); economic sustainability (through local economic development) and institutional sustainability (through appropriate mechanisms for delivery). In this regard, it is much more in line with international thinking on urban sustainability and starts to acknowledge the complex systemic relationships of different aspects of

human settlements that need to be addressed to ensure long-term sustainability.

A concern, however, that some may point out relates to the single focus on urban development as opposed to an integrated strategy for both urban and rural development. On the other hand, urban and rural development, although they should be considered in an integrated way at a strategic level, may in fact require separate frameworks to highlight different approaches required for development in different settings, as long as urban development is not propagated above rural development.

3.4 The Rural Development Framework (1997)

The Rural Development Framework describes how government, working with rural people, aims to achieve a rapid and sustained reduction in absolute rural poverty. Development in rural areas requires:

- institutional development aimed at helping rural people set the priorities in their own communities, through effective and democratic bodies, by providing the local capacity and access to funds for them to plan and implement local economic development;
- investment in basic infrastructure and social services, including the provision of physical infrastructure (for example housing, water and power supplies, transport) and social services (for example basic health care and schools);
- improving income and economic opportunities by broadening access to natural resources (for example arable and grazing land, irrigation water, woodland and forests);
- restoration of basic economic rights to marginalised rural areas by establishing periodic markets as the organising spatial and temporal framework for development;
- resource conservation through investing in efforts in the sustainable use of natural resources; and
- justice, equity and security aimed at dealing with the injustices of the past and ensuring the safety and security of the rural population, especially that of women.

Although the framework does not use the words “sustainable development” or “sustainability” per se, it touches on many aspects of sustainable development such as access to basic services and economic opportunities, local economic development, conservation of the ecological context and social sustainability, such as justice, equity and safety. It also acknowledges that rural development is crucial for long-term sustainability on a national level.

Many of the proactive ideas contained in this framework were taken further in the development of the Integrated Sustainable Rural Development Strategy (2001).

3.5 Housing programmes and support institutions

A number of other measures were also introduced to make the housing development process more sustainable. These included the stabilising of the housing environment by introducing the Masakhane Campaign, the Mortgage Indemnity Fund (MIF), Servcon Housing Solutions, Thubelisha (meaning “new opportunity”) Homes and the National Home Builders’ Registration Council (NHBRC).

The Mortgage Indemnity Fund was established in 1995 to assist people to normalise and improve their relationships with lenders. As originally envisaged, the Fund’s activities came to an end in May 1998 after a longer-term framework of continued relations between banks, Government and under-serviced communities had been put in place. Servcon was established in 1995 to deal with the non-payment of mortgages in the banking sector and Thubelisha homes was created to hold and dispose of housing stock for right-sizing clients. Bond (2002) argues that the success of this fund was undermined because of the underlying market-centred approach outlined in the Housing White Paper. In this context, the Mortgage Indemnity Fund indirectly acted as a red-lining instrument. Servcon also had limited success as there where very few available low-cost properties for households to “right-size” to.[26]

The aim of the National Home Builders’ Registration Council (NHBRC) is to provide protection for all new housing consumers against defined defects. It funds a national warranty fund to be able to intervene where builders fail to honour a standard warranty and therefore provides a mechanism for quality control and therefore for higher quality houses.

The strategy to mobilise housing credit involves the development of mechanisms and approaches towards risk management and sharing and the development of a track record

of experience in the low-income housing market, so that the private sector is "brought back" into this market segment. Mobilising housing credit is spearheaded by the National Urban Reconstruction and Housing Agency (NURCHA) and the National Housing Finance Corporation (NHFC). NURCHA provides guarantees as security to lenders who advance bridging finance and other assistance to intermediaries servicing the low-income housing market. NURCHA will also facilitate the new savings contribution of R2 479 required by the revised subsidy scheme (see 5.2.2 (a)). It is interesting to note that this amount (R2 479) is the current shortfall, according to the NHBRC, with the R16 000 subsidy in achieving a minimum norms and standard house. While Cabinet has approved an annual escalation of the subsidy subject to inflation, it is not clear if the R2 479 will escalate accordingly.

The NHFC acts as a wholesale financier by taking investments from contractual saving institutions and directing finance and other assistance to intermediaries servicing the low-income housing market. These institutions support the housing delivery process and ensure greater economic viability, thus contributing to the long-term sustainability of these projects.[27]

The NHFC, however, has not achieved success in reducing interest rates, or in increasing access credit for low-income households and in keeping targeted intermediate lenders, such as the defunct Community Bank, afloat.[28] Although its aims were noble, it may therefore be questioned to what degree it contributed to increased urban sustainability.

The Rural Housing Loan Fund (RHLF) is a Section 21 (non-profit) company with the aim of improving the housing situation of rural people by increasing access to housing loans. The fund provides wholesale finance and support to non-traditional lenders to enable them to lend to low-income earners in rural areas. It therefore provides access to economic resources to a group traditionally excluded from it, thus creating additional opportunities for life improvement.

A policy for supporting the People's Housing Process (PHP) was adopted in 1998 to assist people to build or organise the building of their own homes by accessing housing subsidies and technical, financial, logistical and administrative support regarding the building of their homes on a basis which is sustainable and affordable. The People's Housing Partnership Trust (PHP Trust) is the key driver to implement the support programme for the People's Housing Process. The United Nations Development Programme (UNDP), the United Nations Centre for Human Settlements (UNCHS) and the United States Agency for International Development (USAID) have committed funding and technical assistance to this programme, which will increase its financial viability.

Housing institutions have been established in support of housing policy and strategy such as the People's Housing Partnership Trust and the Social Housing Foundation. They have filled a capacity gap and will continue to build capacity in the housing sector for some time to come.

3.6 Social Housing

Social housing is a particular approach to affordable housing. Based on the strength of group or collective ownership, social housing seeks an institutional approach in accessing and managing affordable housing for low-income earners. The intention of a social housing approach is to provide low-income households with an affordable housing option as well as a host of other services which provide community development and empowerment benefits and promote a life style conducive to community living.[29]

Social housing can therefore contribute to the creation of more sustainable human settlements through community involvement, increased benefits and ultimately a higher quality of life.

There is no well-developed, logical and consistent regulatory framework for housing associations in South Africa. There is currently no policy for social housing, therefore social housing institutions must be set up within the framework of the Social Housing Foundation before they can access the institutional subsidies which are used for the development of social housing.[30] The Social Housing Foundation was established by the NHFC in 1997 as a Section 21 Company to promote, support and assist the development of social housing in South Africa. It works closely with the Housing Institutions Development Fund (HIDF) of the NHCF.

3.7 National Standards and the Housing Code

The Housing Act requires that the Minister of Housing sets national norms and standards for housing development in South Africa. This is to ensure that beneficiaries of housing subsidies receive a product that is good value in terms of quality and the level of service provided.

The norms and standards introduced by the Minister apply to all subsidy categories (see box for new allocations per category) with the exception of the Rural Subsidy and projects that constitute *in situ* upgrading of informal settlements. These norms and standards will ensure better quality housing and a basic level of services that will contribute to achieving sustainable human settlements.

The Housing Code (2000) is not a new statement of policy, but a confirmation of existing policy. It sets out the linkages between various policy programmes and represents the culmination of government's thinking and practice as it relates to housing in South Africa. It is the home of all National Housing Policy, current and future. According to the Minister of Housing, its aim is to identify opportunities for creativity in housing delivery, for gearing resources and for building new approaches and therefore to act as a tool to assist in mobilising and harnessing the full diversity of resources, innovation, energy and the initiative of individuals, communities and the private sector.[31]

The Housing Code also acknowledges that housing is one of the cornerstones of rebuilding our social structures, regenerating the economy and integrating the communities, which is also essential for creating more sustainable human settlements. In this way, it therefore supports the creation of such settlements.

4. Department of Local and Provincial Government

The Department of Local and Provincial Government (DPLG) was previously known as the Department of Constitutional Development (DCD). The aim of DCD was to develop and implement the constitution and to develop provincial and local government. A key focus of the department that impacted on human settlements was the promotion of the capacity and long-term sustainability of the local sphere of government. This has resulted in the policy of creating developmental local government as outlined in the White Paper on Local Government (1998).

4.1 White Paper for Local Government (1998)

The White Paper was developed as part of the process envisaged in the Constitution to transform local government into democratic and developmental local municipalities. The Constitution of South Africa establishes local government as a distinct sphere of government, yet closely interrelated with national and provincial governments. The first all-inclusive general election of 1994 paved the way for the establishment of transitional councils as the first phase in the local government transition process, which has as its aim the transformation of local government in line with the vision of democratic and developmental local government. These transitional local councils were divided into four different forms of municipalities: Metropolitan councils with metropolitan local councils, district councils, transitional local councils (TLCs), primarily in urban areas, ranging from bigger cities to smaller towns, and rural councils, responsible for rural areas between cities and towns.

The White Paper establishes the basis for a new developmental local government system that is committed to working with citizens, groups and communities to create sustainable human settlements that provide for a decent quality of life and meet the social, economic and material needs of communities in a holistic way.

In order to achieve this vision, the White Paper identifies four key developmental outcomes:

- the provision of household infrastructure and services;
- the creation of liveable, integrated cities, towns and rural areas;
- local economic development; and
- community empowerment and distribution.

Each of these is seen within the context of national development and principles and values of social justice, gender and racial equality, nation building and regeneration of the environment.

Developmental local government is characterised by:

- a maximisation of social development and economic growth;
- integration and co-ordination;

- democratisation of development;
- empowerment and redistribution; and
- a leading and learning approach.

One of the significant aspects of the White Paper is the focus on integrated planning, a process through which the municipality is expected to establish a development plan for the short, medium and long term through the development and implementation of Integrated Development Plans (IDPs). In effect, IDPs are therefore planning and strategic frameworks to help municipalities fulfil their developmental mandate. This will not only ensure that local governments develop and implement integrated plans, but also that there is an increased move towards integrated development (both spatially and institutionally) at local level.

The White Paper also establishes the foundation for the Municipal Structures Act and the Municipal Systems Act.

The White Paper lays the foundation for the creation of sustainable human settlements through a democratic and developmental local government and proceeds to define this vision. It therefore endorses the idea of sustainable development in a very clear and direct way through an emphasis on institutional sustainability and the development of mechanisms to plan, manage and implement sustainable human settlements.

A concern, however, is the limited – or lack of – attention to community participation and the nature thereof. It is no use to focus on a developmental local government if methods of community participation are not central to its implementation. It also does not address the issue of redistribution (central in both the RDP and goals of Gear) in a sufficient way. This would have required a stronger people-centred approach, which may have frightened investors and the market in general. Sustainability is not only reliant on economic viability, but also requires attention to social and bio-physical sustainability. In addition, it cannot be expected that economic participation should be determined by market-opportunities alone if many South African residents start from an unequal playing field due to past inequalities.

4.2 Local Government: Municipal Demarcation Act (1998)

This Act was promulgated to facilitate the demarcation process in South Africa, according to which all local municipalities were transformed and restructured according to new boundaries, to reduce the number of municipalities in the country and save administrative costs, as well as to integrate urban and rural development at a local level, or in other words to improve the sustainability of local government. It also sets out the criteria for demarcation and the objectives of demarcation, as well as factors to be taken into account by the Demarcation Board when it determines a municipal boundary.

The result was that 284 municipalities in all have been demarcated: six metropolitan municipalities, 47 district municipalities and 231 local municipalities. The structures of these municipalities, as well as their respective functions, are outlined in the Local Government: Municipal Structures Act.

4.3 Local Government: Municipal Structures Act (1998)

The Municipal Structures Act lays the foundation for the final phase in the transition process towards democratic and developmental local government, in which municipalities will be expected to fulfil their constitutional obligations to “ensure sustainable, effective and efficient municipal services, promote social and economic development, encourage a safe and healthy environment by working with communities in creating environments and human settlements in which all people can lead uplifted and dignified lives” (1). This reflects great similarities to the Housing Act and the UDF, indicating that different government departments started to aim towards the same vision of sustainable human settlements.

The main purpose of the Act is to provide for the establishment and operation of the appropriate structures to ensure that the newly formed municipalities will be able to achieve such a vision. The vision clearly reflects the goals of sustainable development and, as such, promotes efforts towards urban sustainability. The only point of concern is again an apparent disparity between the understanding of sustainability as meta-concept/aim for development and sustainability as one of the criteria for development, referring more specifically to viability.

The Act provides for the establishment of different types of local councils, including metropolitan councils, as well as district councils which will be responsible for the

integrated planning and management of a number of local councils within a geographic area. A positive result of the new structures will be that they allow for more integrated planning between previously segregated areas of the same town or city, and urban and rural areas, as both of these types of areas will now be the responsibility of one municipality. However, while the nature and structures of local and district councils are clearly discussed in the Act, the roles of the councils are not clearly distinguishable. This often results in ineffective management and delayed service delivery. In such a case the Act stipulates that the matter should be decided by the provincial MEC for local government. Therefore, while the Act strives towards institutional sustainability, it fails to clearly distinguish one of the crucial aspects of that sustainability, namely exactly who is responsible for what functions.

4.4 Local Government: Municipal Systems Act (2000)

This Act was promulgated to set out the core principles, mechanisms and processes that will give meaning to democratic and developmental local government and empower municipalities to progressively move towards the social and economic upliftment of communities and the provision of basic services to all the people of South Africa and specifically the poor and disadvantaged. Important aspects that are highlighted in the Act as necessary to achieve this aim include a focus on community participation, integrated development and performance management and monitoring. The Act also provides for increased inter-governmental cooperation and support between the different spheres of government. The main purpose of the Act is therefore to provide improved systems to ensure that the newly formed municipalities will be able to achieve such a vision.

The Act also builds on the concept of integrated development introduced in the White Paper and makes the development and implementation of Integrated Development Plans (IDPs) mandatory for all local municipalities in South Africa, thus improving the chances of achieving both institutional and spatial integration. Another positive aspect is the attention given to balanced development, where development towards the social and economic upliftment of communities is required to be in harmony with their local natural environment. This assists towards the creation of a balance between bio-physical, economic (including financial) and social sustainability.

The IDP is, however, the one mechanism that has the influence to make or break long-term urban sustainability. In this regard, the new Act establishes a basis, and very basic guidelines, for the development of IDPs. It however has to be questioned whether these guidelines and the IDP Manual elaborating the process are enough to ensure that this area will receive proper attention and that local officials are aware of the intention and nature of IDPs, as well as procedures to develop appropriate IDPs. Confusion in this regard and outsourcing of IDP development to consultants has often led to poor understanding of the development challenges of the particular local authority area, and subsequently to poor IDPs.

5. Department of Agriculture and Land Affairs

Land policy in South Africa has two broad thrusts – namely development facilitation and spatial land development planning and reform.

5.1 Development Facilitation Act (1995)

The DFA is the only post-1994 planning law enacted by Parliament. The main purpose of the DFA is to facilitate development facilitation in the new democracy and act as interim measure to bridge the gap between the old apartheid-planning laws and a new planning system reflecting the needs and priorities of a democratic South Africa.

The key features on the DFA are:

- *General principles for land development:*

These normative principles reject low-density, segregated, fragmented and mono-functional development and advocate compact, integrated and mixed-use settlements.

- *Land Development Objectives (LDOs)*

The DFA requires that every municipality establish LDOs, effectively local land-use plans, to allow integrated and strategic land-use planning.

- *Development tribunals*

The DFA provides for a development tribunal to be established in each province to provide a speedy route for the consideration of land-use change and land-development applications.

It is envisioned that the DFA will be replaced by a Land Use Act, which also builds on the White Paper on Spatial Planning and Land Use Management (2001).

The DFA paved the way for integrated development based on normative planning principles. This introduced a huge shift from previous planning policies and legislation based on specific standards and advocating a very technocratic and master-planned approach.

The DFA introduced principles such as promoting equity, efficiency, planning for the public good and ensuring the good use of scarce resources, which together started to pave the way for more sustainable development. Although the sum of the principles points towards sustainable development, it was not yet identified as the meta-concept or over-arching direction for planning and development in South Africa. Sustainable development was, however, mentioned as one of the development principles, but it related more to environmental or bio-physical sustainability, as was the case with most of the earlier policy documents.

5.2 White Paper on Spatial Planning and Land Use Management (2001)

This White Paper on Spatial and Land Use Management follows the development of a *Green Paper for Planning and Development* (1998). The White Paper therefore aims to rationalise and integrate an existing plethora of planning laws and policies into one national system that will be applicable in every province. The White Paper was greatly influenced by Chapter 10 of Agenda 21, which refers to an "integrated approach to the planning and management of land resources", and its vision is firmly grounded on the objective of Chapter 10:

> *"The broad objective is to facilitate allocation of land to the uses that provide the greatest sustainable benefits and promote the transition to a sustainable and integrated management of land resources."* (Agenda 21, Chapter 10)

The vision of a new approach calls for *integrated planning for sustainable management of land resources*. The specific needs highlighted to be achieved by the new system also come directly from Chapter 10 of Agenda 21.

Another important aspect of the White Paper is its focus on cooperative governance to maximise spatial planning and land-use efforts and ensure integration across various spheres of government. In this regard the White Paper very specifically identifies the role of all three government spheres and also points to the role that each will play as land-use regulators.

The intended outcome of the White Paper is a new national law for spatial planning, land use and land development, namely a land-use bill, and finally a Land Use Act (as mentioned above). This law will replace the Physical Planning Act and Development Facilitation Act, with the aim of assisting Government in the formulation of policies, plans and strategies for land use and development, which address, confront and resolve spatial, economic, social and environmental problems of the country.

The new White Paper on Spatial Planning and Land Use Management shows a significant progression from previous planning policies. Some of these positive aspects include:

- A much more holistic focus on urban sustainability and sustainable development, as set out in Agenda 21.
- A reduction in the number of planning policies.
- Significant improvements towards integrated planning through both an integration of planning processes (remarkable cross-references to other legislation influencing planning and land use management, such as the Municipal Systems Act, including IDPs and the Environment Conservation Act, including EIAs), as well as an integration between different spheres of government and their respective roles. It therefore starts to show the linkages between various policies and laws that are crucial to ensure departmental cooperation and ultimately sustainable development.
- Streamlining the principles set out in the DFA.
- Aiming to absorb LDOs, as was required by the DFA, into the IDP process to avoid duplication of work and various planning processes, which will enhance institutional sustainability.
- Emphasising the need for continuous training, especially with regard to a normative planning system, as well as the importance of monitoring and reviewing to ensure that programmes and projects continue to reflect the norms and principles. This will assist towards urban sustainability and help to ensure sustainable development. In addition, it will contribute to the development of more appropriate IDPs, as pointed out before.

However, despite the number of positive changes, a few areas of concern still remain:

- The most notable area of concern relates to the understanding and interpretation of the term *sustainability/sustainable*. In this regard the White Paper reveals the ambiguous nature of the concept. While it starts out to refer to sustainability and sustainable development as the meta-concept or driving force for everything contained in the White Paper (based on Agenda 21), in other words as the overall aim to be achieved by the White Paper, it then proceeds to name *sustainability* as one of the principles. It may be that sustainability in this regard refers to viability. This ambiguity creates tensions between the different possibilities for interpreting the word, which may lead to increased confusion and a lack of agreement between various role-players involved with spatial planning and land-use management.
- Another concern is related to the term *equality*. One of the principles refers to a need for equality. While *equality* refers to a general state of being equal (which may never be achieved in terms of income distribution, etc.), *equity* refers to fairness, impartiality and justice – in other words to ensure fair and just planning and development (also echoed in the Housing White Paper and Act). In this regard, it would have been more appropriate to use the term *equity*, instead of *equality,* to avoid the confusion and misinterpretation that negatively influence the planning process.

5.3 White Paper on South African Land Policy (1997)

The government developed this White Paper in 1997 to help create conditions of stability and certainty both at a national and household level through land reform. This is essential for sustainable growth and development in South Africa and a precondition for achieving the goals of Government in terms of creating employment and redistribution. The purpose of this land reform policy is fourfold:

- to redress the injustices of apartheid;
- to foster national reconciliation and stability;
- to underpin economic growth; and
- to improve household welfare and alleviate poverty.

The land reform policy has three components:

- Land Restitution, which involves returning land;
- Land Redistribution, based on assistance from government in the form of a Settlement/Land Acquisition Grant to make it possible for poor and disadvantaged people to buy land; and
- Land Tenure Reform, aiming to bring all people occupying land under a unitary, legally validated system of landholding.

The White Paper emphasises the importance of local participation in decision-making, one of the indicators of sustainable human settlements. It also highlights the importance of gender equity, economic viability and environmental sustainability in the implementation of land-reform programmes. It therefore embraces a more holistic approach to sustainable development, with a more people-centred approach and much closer links with the original goals of the RDP. It also supports the Bill of Rights in the new Constitution which guarantees existing property rights; but it simultaneously places the State under a constitutional duty to take reasonable steps to enable citizens to gain access to land, to promote security of tenure, and to return land to those who were dispossessed of property as a result off discriminatory laws.

Its due attention to environmental sustainability is also very positive, acknowledging the potential risks of a land-redistribution programme, but aiming to achieve land reform without extending environmental degradation over a wider area. The White Paper emphasises the need for the new owners to be the principals in the planning process and take responsibility for the long-term maintenance of these areas. It also grapples with the issue of how to provide for the subdivision of agricultural land to meet the land needs of small-scale farmers in a manner that prevents conversion of land to other uses.

It is not always sustainable to divide farms into small pieces of land and sell these to 5–10 farmers. The productivity of the land, the climate, etc., has to be considered, as well as the need for rural subsistence versus national food security (through commercial farming). There should be a balance between these two approaches.

5.4 Land Reform (Labour Tenants) Act (1996)

This Act was promulgated to provide security of tenure for labour tenants and those persons occupying land as a result of their association with labour tenants, as well as to provide for the acquisition of land and rights in land by labour tenants. The Act declares that a person who was a labour tenant on 2 June 1995 shall have the right, with his or her family members, to occupy and use part of the farm in question. A labour tenant or his or her associate may only be evicted in terms of an order of the court issued under the conditions described in this Act. If the tenant is evicted, the owner has to pay just and equitable compensation to the tenant or his or her associates. The Act also provides for the right to acquire land and allow tenants to apply for the award of land which he or she and his or her family had occupied during a period of five years immediately prior to the commencement of this Act.

This Act has led to the eviction of many labour tenants, resulting in increased pressure on the municipalities of small towns to provide housing and services to these displaced labour tenants.

5.5 Extension of Security of Tenure Act (1997)

This Act means to facilitate long-term security of land tenure; to regulate the conditions of residence on certain land; and to regulate the conditions and circumstances under which persons, whose right of residence has been terminated, may be evicted from land.

The Act states that:

" If a person who resided on or used land on 4 February 1997 previously did so with consent, and such consent was lawfully withdrawn prior to such date –

- *That person shall be deemed to be an occupier, provided that he or she has resided continuously on that land since consent was withdrawn."*

This provision tried to counteract the effects of the Land Reform (Labour Tenants) Act. However, if the right of residence solely arises from an employment agreement, this right may be terminated if the occupier resigns from employment or is dismissed in accordance with the provisions of the Labour Relations Act. This provision led to the termination of employment of many labourers, and their subsequent eviction, as the Act does not allow the eviction of a labourer who has resided on the land for more than 10 years and who has reached the age of 60 years, or can no longer supply labour to the owner as a result of ill health, injury or disability.

The Act further provides for access to grant subsidies for the provision of accommodation both on-site and off-site. The latter is meant to support the development of agri-villages where social services such as schools and clinics can be provided to farm workers. However, in practice this means that farm labourers then lose the other benefits they have enjoyed such as land for subsistence agriculture and livestock farming.

5.6 Land Reform Programmes

Land reform includes programmes for land redistribution, restitution and tenure reform. Currently these programmes have a more rural focus and impact. The *Land Redistribution Programme* makes it possible for poor and disadvantaged people to buy land with the help of a Settlement / Land Acquisition Grant.

The *Land Restitution Programme* was established to restore land or compensate people dispossessed by racially discriminatory legislation and practices.

The *Land Tenure Reform Programme* is the most complex area of land reform. It aims to bring all people occupying land under a unitary, legally validated system of landholding, to devise secure forms of land tenure, to help resolve tenure disputes and to provide alternatives for people who are displaced in the process. These programmes are enforced through a number of Acts (see box below).

Main National Land Reform Laws

- *The Restitution of Land Rights Act, 22 of 1994*

It provides for the restitution of rights in land to those dispossessed of land in terms of racially based policies of the past.

- *The Provision of Certain Land for Settlement Act, 126 of 1993 and the Land Restitution and Reform Laws Amendment Act (1997)*

These Acts provide for the designation of land for settlement purposes and financial assistance to people acquiring land and for settlement support.

- *The Development Facilitation Act, 67 of 1995*

This Act introduces measures to speed up land development, especially serviced land for low-income housing (discussed in detail above).

- *The Upgrading of Land Tenure Rights Act, 2 of 1993*

This Act provides for the upgrading of various forms of tenure.

- *The Land Administration Act, 2 of 1995*

This Act makes provision for the assignment and delegation of powers to the appropriate authorities.

- *The Land Reform (Labour Tenants) Act, 3 of 1996*

This Act provides for the purchase of land by labour tenants and the provision of subsidies to this end.

By addressing the issues that could hinder and stall the development process, these programmes and Acts can contribute to smoother processes and thereby increase the opportunity for sustainable development and ultimately more sustainable human settlements in South Africa. An only concern relates to the knowledge regarding these programmes and Acts within certain local authorities and capacity to implement them.

6. Department of Transport

The aim of the Department of Transport is to promote efficient transport systems on a national level. Its vision is:

> *"… to provide safe, reliable, effective efficient and fully-integrated transport operations and infrastructure which will best meet the needs of freight and passenger customers at improving levels of service and cost, in a fashion which supports government strategies for economic and social development whilst being environmentally and economically sustainable".*[32]

Already through its vision, the department addresses bio-physical and economic sustainability and therefore points towards the creation of sustainable human settlements through appropriate transport intervention.

6.1 White Paper on National Transport and Moving South Africa (1998)

Transport is seen in South African policy as having a key role not only in promoting access for citizens but also in integrating South Africa's cities and regions which are spatially, as well as socially, racially and economically divided and disjointed. Accessibility is one of the key aspects of a sustainable human settlement.

The key policy being employed by the Department of Transport is that of development corridors. This vision is set out in the White Paper on National Transport Policy and is developed further in the Department's 1998 Moving South Africa document which identifies three strategic actions:

- densify corridors;
- optimise modal economics and service mix; and
- improve the performance of private firms.

Transport policy is closely linked with that of the *Department of Trade and Industry* and its Spatial Development Initiatives (SDIs), which aim to unlock inherent economic potential in specific spatial locations in Southern Africa and thereby also promote regional integration and trade relations.

The philosophy behind SDIs is to combine regional private and public investment projects to maximise economic and social benefits. A number of SDIs are currently under way, including the Maputo Corridor, Pietermaritzburg-Durban-Richards Bay (industrial), Uitenhage-Port Elizabeth-East London (industrial), East London-Port St John (tourist/agricultural), Atlantis-Saldanha (industrial), Pretoria-Brits-Rustenburg and Northern KwaZulu-Natal (agri-tourist).[33]

6.2 The Urban Corridor Programme

The Urban Corridor Programme is currently advocating the densification of land-use along identified corridors in order to optimise investment in public transport infrastructure. The most advanced planning in respect of the implementation of such a corridor is the Wetton-Lansdowne Road Corridor Project in Cape Town, which integrates a formally isolated area (Khayelitsha/Mitchells Plain) with the Cape Town urban centre. There has been an increase of residential density along the route, a greater mix of employment-generation activities and the development of a secondary

node (Phillipi) as a commercial and employment centre.

Development corridors have also been proposed for other large cities such as Johannesburg, Durban (for example between Durban inner city and KwaMashu/Inanda) and in Buffalo City (between East London and Mdantsane).

While densification is one way of achieving more compact cities and thus more sustainable human settlements, it should be born in mind what exactly is meant by densification in terms of practical implementation. It was stated earlier in the document (Chapter 2) that densification per se is not always conducive to the creation of sustainable settlements due to specific local conditions or needs. It is necessary that policies elaborate on the implications of a particular term or principle, and qualify how and where to implement it.

7. Department of Environmental Affairs & Tourism

Over the past five years, the Department of Environmental Affairs & Tourism (DEA&T) has concentrated on the development of policy that takes account of South Africa's return to the international fold and the responsibilities which that entails, as well as the shift towards sustainable development in government policy priorities. A wide range of discussion documents, policy frameworks and legislation supports this move towards sustainable development.

7.1 White Paper on Environmental Management Policy (1998)

South African environmental policy is summed up in the White Paper on Environmental Management Policy for South Africa published in May 1998. This document focuses on the broad environmental management policy which impacts on human settlements.

The White Paper adopts a new paradigm of sustainable development, based on integrated and co-ordinated environmental management. While it recognises the need for people-centred development that promotes social justice and equity, the White Paper cautions against growth and development that ignores environmental issues (in other words, development for development's sake). It argues that while this approach may lead to short-term improvements in standards, it will further degrade living environments and degrade the resource base upon which we depend for survival. This therefore places sustainable development as a national priority for government and highlights the importance of bio-physical sustainability as a balance to economic sustainability.

The goal with this policy was to move from unrestrained and environmentally insensitive development to sustainable development in order to achieve an environmentally sustainable economy that is in balance with ecological processes. This is to be achieved through The National Environmental Strategy and the National Environmental Management Act.

7.2 The National Environmental Management Act (NEMA)

The National Environmental Management Act (NEMA) was promulgated in 1998 to provide for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance, procedures for co-ordinating environmental functions exercised by organs of state. The aim of the act is therefore to ensure:

- sustainable use and equitable access;
- transformation of governance;
- spreading environmental responsibility to civil society; and
- assistance towards effective, transparent, accountable and coherent government.

The Act therefore promotes strong sustainability through an emphasis on sustainable resource use, community participation and government transparency.

NEMA requires that national and provincial departments exercising functions which may affect the environment prepare an Environmental Implementation Plan (EIP) every four years. It also requires that national and provincial departments exercising functions involving the management of the environment must prepare an Environmental Management Plan (EMP) every four years. Provinces must ensure that municipalities comply with their EIP or EMP.

7.3 White Paper on Integrated Pollution and Waste Management

The White Paper aims at pollution prevention and minimisation at source, managing the

impact of pollution and waste on the receiving environment and rehabilitating damaged environments. It sets specific standards to achieve human health and safety as well as sustained ecosystem maintenance, and therefore to contribute to achieving an improved quality of life in human settlements.

7.4 White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (1997)

This White Paper aims to:

- conserve the diversity of landscapes, eco-systems, habitats, communities, populations, species and genes;
- ensure the sustainable use of biological resources and minimise any adverse impacts on biodiversity;
- ensure that benefits derived from the use and development of 's genetic resources serve national interests;
- improve the capacity to conserve and use biodiversity and to address threats to biodiversity;
- create conditions and incentives to support conservation and the sustainable use of biodiversity; and
- promote conservation and sustainable use at the international level.

This paper also focuses on bio-physical sustainability through a focus on resource use and the protection of the environment and in this way contributes to the establishment of sustainable human settlements.

7.5 White Paper on Sustainable Coastal Development in South Africa (1999)

This document advocates the maximisation of opportunities for economic and social development connected with coastal resources through the maintenance of health, diversity and productivity of coastal eco-systems. It therefore promotes the development of coastal settlements

7.6 Climate Change Discussion Document (1998)

This document is aimed at reducing carbon dioxide and greenhouse gasses and will mainly affect energy-intensive industries. It is still to be developed into a national policy.

It however, starts to define government's position towards climate change and indicates that government is willing to take responsibility for South Africa's role regarding climate change. How this will translate into practice still remains to be seen. The position document may remain only lip-service to a global concern, or may in fact become a powerful guideline document to reduce South Africa's contribution to climate change.

7.7 Environmental Impact Assessments (EIAs)

The National Environmental Impact Assessment (EIA) regulations require mandatory EIAs for proposed specified activities and for changes in listed land uses, and prescribe the process to be followed. They were promulgated in September 1997 under Sections 26 and 28 of the Environmental Conservation Act (73 of 1989). EIAs affect housing areas in the few cases where there is a change in land use. The regulations have been criticised for being activity- instead of impact-based, for not providing a comprehensive list of activities requiring EIA, for not being coordinated with other legislation, and for allowing a situation where an appeal against a decision made by the Minister must be made to the same Minister.[34] The new White Paper on Spatial Development and Land Use Planning will hopefully assist to streamline complex and often overlapping processes (see 5.2).

7.8 Tourism White Paper (1996)

Tourism can have a major impact on the sustainability of both the bio-physical and the built environments. It is therefore fundamental that all current tourism and development initiatives at all spheres of government take this into consideration. The Tourism White Paper provides guidelines for sustainable tourism development and sets out a vision and overall objectives for tourism in SA, as well as principles for the tourism sector.

8. Department of Water Affairs and Forestry (DWAF)

The DWAF has successfully formulated water supply and sanitation policy. Water supply and sanitation services prior to 1994 had been dealt with in a fragmented and inconsistent manner in provincial ordinances, with rural water supply and sanitation being left largely to the "homeland" governments to deal with.

The new arrangements will add to institutional efficiency and this in turn will contribute to institutional sustainability.

8.1 White Paper on Water Supply and Sanitation (1994)

In the White Paper on Water Supply and Sanitation (November, 1994), the DWAF formulated a strategy to build competent local and provincial agencies capable of providing adequate water supply and sanitation services.

It also developed a Framework for Water Services, 1997, targeted at the new democratic local government structures.

8.2 The Water Services Act (1997)

The Water Services Act (1997) provides a regulatory framework for the provision of water services by clearly defining the roles and responsibilities of the different spheres of government. It reinforces the constitutional right of every citizen to basic water supply and sanitation and places a duty on all water institutions to take reasonable measures to realise these rights. The Act also requires that every Water Services Authority prepares a Water Services Development Plan (as one output of the integrated development planning process) for its area, in consultation with the community.

The Act therefore goes a long way to ensuring basic access to water for all people and in this way contributing to a higher quality of life for all citizens.

8.3 The White Paper on Basic Household Sanitation (2001)

The National Sanitation White Paper (Oct 2001) focuses on providing adequate sanitation for households, schools and clinics, improving household waste collection and disposal, and educating the public about hygiene. Key focus areas will include rural, peri-urban and informal settlements where the need is greatest. The policy aims to wipe out the backlog in sanitation by 2010.

The policy highlights the sanitation problem; it provides policy principles, guidelines on the roles and responsibilities of all relevant departments and role-players in providing adequate sanitation, as well as technical options for the construction of toilets.

8.4 Framework for a National Sanitation Strategy (2001)

The purpose of the Framework for a National Sanitation Strategy is to accelerate sanitation delivery with the focus on rural households, peri-urban areas and informal settlements, as well as institutional sanitation (schools and clinics) through intersectoral collaboration and integrated planning. Government plans to facilitate improved service delivery by supporting communities in providing and using sustainable (affordable, community-run) sanitation services.

Provincial and regional sanitation strategies feed into the National Sanitation Strategy, which forms part of the Water Services Development Plans and IDPs of government.

8.5 Main programmes

The Department has had four main programmes since 1994, the first three being phases of the implementation of the RDP. RDP1 aimed at providing basic water supply to RDP standards (20-30 litres per person, per day, and within 200 m) by means of an integrated people-driven programme. The second programme, RDP2, initiated a process to ensure access to adequate domestic sanitation. However, communities put more emphasis on water than sanitation. RDP3 recognised that the first two programmes had neglected sanitation and therefore focused more on the issue of sanitation. The Community Water Supply and Sanitation Programme (CWSS) was directed towards the monitoring and evaluation of sanitation methods, the co-ordination and training of local authorities and the co-ordination of lessons learned through the RDP process.

9. Department of Minerals & Energy

9.1 White Paper on Energy Policy (1998)

Through this document government commits itself to the provision of affordable and sustainable energy services. Energy production and distribution should not only be sustainable, but should lead to improvement in the standard of living for all the country's citizens.

Whereas the South African energy sector has historically tended to promote policies that predominantly address supply-side issues, this White Paper endeavours to address demand-side issues as well and introduces a more holistic integrated energy planning approach. The White Paper also looks at the need for equitable access to affordable public transport and comments on several energy-related transport challenges. It furthermore declares the negative environmental and health effects

of air pollution arising from coal and wood use in households as an immediate priority for an energy-environment policy.

This policy restructures the electricity distribution sector into a small number of regional electricity distributors, leading to increased efficiency and reduced costs. It also promotes energy efficiency and the increased use of renewable energy through the installation of solar home systems and the better use of biomass fuel.

10. Department of Health

10.1 The White Paper on the Transformation of the Health System of South Africa (1997)

In this document the Department has adopted a strong primary healthcare policy which promotes equity, accessibility and the utilisation of health services, as well as extending the availability of appropriate health services. It has also given priority and resources to combat HIV/Aids, TB, malaria and diarrhoeal diseases as encouraged in the Habitat Agenda.

10.2 Main Programmes

There are a number of programmes that fall under the Department of Health such as the Aids Action Plan, a programme that focuses on mass Aids awareness and mobilisation. Another programme is the Clinics Building and Upgrading Programme (CBUP), which forms part of government's infrastructure development programme to provide healthcare facilities to previously disadvantaged communities, as well as to women and children who previously did not have proper access to these services. A third programme run by the Department is the National Immunisation Programme, which campaigns for the immunisation of children under the age of 5 against poliomyelitis and those under 15 against measles.

Environmental Health and Health Promotion Programmes are specific in interfacing with other stakeholders in government and privately in the promotion of healthy sustainable settlements. These programmes have projects that improve accessibility to potable water and sanitation to schools and clinics, improve knowledge and awareness of the management of chemical substances, general pollution and health-promotion schools. There is also a programme on health and safety of workers to ensure sustained good health beyond their working life.

11. Department of Education

Education policy focuses on the quantity and quality of educational infrastructure as well as the need for increased relevance, environmental awareness and understanding of diverse cultures in school curricula. The policy of promoting access to facilities (which should have a more direct impact on human settlements) is weak in terms of the lack of effective monitoring and evaluation mechanisms set up to assess policy impact.[35]

11.1 Main Programmes

In an effort to correct some of the discrepancies in the sector, a number of programmes have been put in place. The National Schools Building Programme (NSBP) is a grant established for school infrastructure development in provinces. This grant represents only part of the total spending on school construction, the other parts being the expenditure from provincial budgets and overseas development grants for this purpose.

The Tirisano campaign, launched in July 1999, was also developed to improve school physical infrastructure development in all provinces. The Department of Education has recently introduced action strategies to address the two broad causes of poor delivery in all provinces – namely declining budgets for new infrastructure development and ongoing maintenance, and unsatisfactory physical planning and implementation capacity. For this purpose the Schools Register of Needs has been established and is reviewed on an annual basis.

The Department of Education also initiated the *Thuba Makote* project. This scheme investigates how the design, construction, management and operation of school buildings can be developed to support cost-effective, high-quality school education as well as supporting community development through training, employment creation and sustainability through access to gardens, workshops and learning resource centres. The project offers an opportunity as well as a valuable test bed to develop a new approach to the provision of education facilities, and for these to further development in the education sector, which will contribute substantially to more sustainable human settlements.

A concern, however, was raised recently regarding the underspending by the Department of Education. The Thuba Makote Rural School Project is among the education priorities worst hit by the underspending: only R1,5 million of the R48 million allocated last year was spent. Over three years R146 million is budgeted for.[36]

12. Department of Safety & Security

Crime has increased since the transition to democracy in 1994. Government responded with two main policy documents, the National Crime Prevention Strategy (NCPS) and the White Paper on Safety and Security, as well as a number of guideline documents.

12.1 The National Crime Prevention Strategy (1996)

The NCPS introduced a focus of crime prevention, as opposed to a hard approach to crime through law enforcement only. The NCPS addressed four key focus areas: re-engineering of the criminal justice system, reducing crime through environmental design, community values and education and trans-national crime. The NCPS also outlined a multi-departmental approach to crime prevention, which focused on increased and necessary cooperation between different government departments, as well as different spheres of government and coordination of their respective activities.

12.2 White Paper on Safety and Security (1999)

The White Paper on Safety and Security encompasses the government's vision and strategy for safety and security during 1999–2004 and builds on the Green Paper for Safety and Security (1994) and the National Crime Prevention Strategy (NCPS) (1996). The White Paper sets out to achieve the vision of greatly improved levels of safety through real reductions in crime, through efficient policing, an effective justice system and greater ability to prevent crime.

The White Paper emphasised two pillars of intervention: law enforcement and social crime prevention (which includes crime prevention through environmental design). Law enforcement is concerned with reducing the opportunity for crime by making it more difficult to commit crime, more risky and less rewarding – thus offering a strong deterrent to crime. Social crime prevention is aimed at reducing the socio-economic and environmental factors that persuade people to commit crimes and become persistent offenders; thus to reduce the opportunities for crime through a proactive approach.

The White Paper focuses on three key areas to meet delivery requirements – namely law enforcement, crime prevention and institutional reform. It also highlights the importance of community involvement (especially through the establishment of Community Policing Forums) and the interaction of different role-players and spheres of government to achieve reduce levels of crime.

12.3 Additional guideline documents

In addition, a number of guideline documents have been developed to assist crime prevention. Two of these are "Making South Africa Safe", which is designed to encourage local crime prevention by assisting the leading role-players (the local authority, the SAPS and the community) to develop their own local crime prevention strategies, and "Designing Safer Places" to assist professionals concerned with the built environment to reduce opportunities for crime through appropriate intervention in the built environment.

13. Department of Sport & Recreation

The quality of life of all people depends in part on the physical and spatial characteristics of cities and towns. People need community and want more liveable neighbourhoods. Policy recognises this, but investment in recreational and cultural facilities in human settlements has taken second place to the drive to meet basic needs.

13.1 White Paper on Sports and Recreation (1998)

In this paper, the provision and upgrading of sport and recreational facilities features as a priority. Issues such as the location of facilities, multi-purpose usage, equitable access and community ownership to assist in maintenance and management are highly valued. Furthermore, the establishment of multi-purpose sport and recreational facilities accessible to the communities, as well as open-space systems are important inclusions in the development of IDPs.

Provision of sport and recreational facilities should be an integral part of a new model for the post-apartheid city. Initiatives such as the Presidential Lead Projects (Integrated Urban

Renewal Projects) and some Department of Public Works projects sometimes include sport and recreation facilities in their overall planning when new developments are initiated. Sport and recreation facilities are also considered as very important in local crime prevention and are addressed in the manual "Designing Safer Places" from the Department of Safety and Security.

14. Department of Arts, Culture, Science & Technology

The Department of Arts, Culture, Science & Technology (DACST) is engaged with programmes that address issues relevant to poverty alleviation, public works programmes, urban regeneration and the provision of new infrastructure, as well as the upgrading and management of existing infrastructure. This is undertaken in partnership with local and provincial authorities and universities, Technikons and parastatal institutions.[37]

This work is informed by the DACST White Paper as well as recent research undertaken by the World Bank, UNESCO and a number of other international agencies which show the relationship between economic and cultural development and argue for a systematic and focused poverty strategy on the part of the arts and culture sectors in developing liveable communities and sustainable economic development. The DACST has planned approximately ten poverty-alleviation projects, all of which impact upon sustainable economic opportunities for previously disadvantaged communities.[38] The DACST is therefore making progress in terms of implementing its policies on sustainable settlements and not only paying lip service to noble ideas.

The DACST has also initiated a data gathering-project (Mapping Creative South Africa) which will collate information on all significant spaces, places and buildings in South Africa that are used to provide opportunities for the arts and culture industries. This will help to develop a more focused urban-renewal strategy for cultural precincts and assist in identifying building needs in rural communities.

15. Department of Welfare

The first five years of democratic governance laid the foundation for responding to the social welfare crisis facing South Africa. The Department of Welfare has put in place legislative and policy frameworks that are in keeping with the principles of the Reconstruction and Development Programme and the constitutional mandate. However, much more needs to be done to create a caring society. Responsibility in this regard calls for the mobilisation of communities to establish a caring society based on the principles of people first, and sustainable development. The Department is guided by the *Batho Pele* (people first) approach in creating a collective vision and strategy to respond to the social crisis, and in transforming social welfare.

A major challenge for the South African welfare system is to redress the inequitable distribution of welfare resources. Prior to 1994, resource allocation favoured institutions that traditionally only served white people and had centred on urban services to the detriment of services to black communities, particularly those located in rural areas and in informal settlements. The government of the day responded with the following policy.

15.1 The Welfare Financing Policy (1999)

The policy sets norms and standards for service delivery by non-governmental organisations to qualify for government funding, which will result in the redirection of welfare resources to historically disadvantaged communities. It is to be implemented progressively over a period of five years. It also promotes the closure or downsizing of institutions like mental hospitals and care facilities for the disabled under the premise that the inhabitants of these facilities should rather stay with their families.

However, the question is whether the community can really cope with this responsibility and whether government is passing on its responsibility to other role-players. This is not to negate the crucial role that NGOs and the community should play, but only to question whether they will receive enough support (financially and politically) from government to achieve the redistribution of welfare facilities and the improvement of services in these areas.

16. Department of Public Works

16.1 White Paper on Transforming Public Service Delivery (1998)

The purpose of this White Paper is to provide a policy framework and a practical

implementation strategy for the transformation of public service delivery. The document is therefore about the "how" of public service provision and more specifically about improving the efficiency and effectiveness of the way in which services are delivered.

This White Paper embraces the idea of *Batho Pele* (people first) and uses this concept as its major vision. If this vision is carried through in public decision-making regarding services and practical delivery, it has the potential to bring about a major change in the way that public services are delivered in South Africa. Improved service delivery can go a long way to contributing to more sustainable human settlements and improving the quality of life of many residents who currently do not have access to basic services. *Batho Pele* reminds public servants that their main goal and prime motivation is service to their customers, all of them.

The document also recognises that improving public service delivery is not a one-off exercise. It is an ongoing and dynamic process that should involve all departments.

16.2 Municipal Infrastructure Investment Framework (MIIF)

This framework provides a model to assist local authorities in the preparation of strategies for the integrated development of their areas. The document provides a framework for a wide range of activities that are undertaken by local authorities to develop sufficient information for forward planning in terms of infrastructure. In this regard the MIIF sets a foundation for gathering information for IDPs, public-private partnerships, local government finance, and investment in infrastructure and disaster management.

The broad objectives of the MIIF is therefore to:

- ensure that local authorities are able to deliver the level of service needed for health and safety;
- enable local authorities to improve on these services;
- suggest how local authorities might structure infrastructure investment in a way that promotes economic development; and
- encourage local authorities to locate investment in infrastructure in a way that promotes the integration of previously divided cities, towns and rural areas.

This framework provides practical assistance for achieving the vision set out in the White Paper on Transforming Public Service Delivery, discussed above. Together, both these documents can assist towards the creation of sustainable human settlements by setting up the pre-conditions and facilitating the processes to ensure the upgrading of marginalised areas that generally have poorer infrastructure and still have a long way to go to catch up with the traditional suburban areas. Sustainability on a metropolitan or city-wide scale will always remain elusive if attention is not paid to the upliftment of underdeveloped areas.

16.3 Programmes

The Department of Public Works' Community-Based Public Works Programme is a specific job-creation and poverty-alleviation programme of Government's, targeted primarily at the rural poor with the objectives of:

- creating short-term employment opportunities for community members by means of construction of public assets;
- creating useful public assets for disadvantaged poor communities; and
- creating sustainable employment opportunities by facilitating micro-business opportunities associated with the community assets created.[39]

After the completion of the CBPWP, a process of evaluation took place resulting in the realignment of the Community Based Public Works Programme. It was recommended that the types of projects be modified, and consequently after the realignment process the concept of clustering was used. The focus shifted from building structures to the development of productive units. Clustering projects facilitate a speedy realisation of the objectives of the Government's Growth, Employment and Redistribution (Gear) strategy. As a result, all line function support departments encourage co-ordination of programmes throughout the structures of government. Emphasis is placed on the development of economic infrastructure, sustainable jobs as well as cognisance of spatial development zones.

17. Cross-cutting policies

There are a number of cross-cutting policies that also have an impact on the planning, financing and creation of settlements. These are concerned with rural development, gender,

children, the youth, and people with disabilities.

17.1 Integrated Sustainable Rural Development Strategy

This document builds on Cabinet Memorandum No 18 of 2000: *A strategic approach to rural development: An integrated Sustainable Rural Strategy* (ISRDS). The document incorporates comments received from Cabinet, directors-general and other senior government officials. Several departments and other agencies also prepared and provided substantive discussion documents on issues involved.

This strategy is designed to realise the vision that will:

> *"…attain socially cohesive and stable rural communities with viable institutions, sustainable economies and universal access to social amenities, able to attract and retain skilled and knowledgeable people, who are equipped to contribute to growth and development"* (p vi).

In order to achieve this vision, the strategic objective is "to ensure that by the year 2010 the rural areas would obtain internal capacity for integrated and sustainable development".

The strategy accepts that successful rural development must be implemented in a participatory and decentralised fashion in order to respond to articulated priorities and observed opportunities at local level. There is a strong focus on Local Government's role in achieving successful rural development and an emphasis of greater local power and autonomy. The ISRDS also highlights the important role of IDPs to achieve integrated development in rural areas.

The strategy therefore acknowledges the importance of local development and participation, as well as a contextual approach to rural development. Through its vision, it also articulates the essence of sustainable development, although the vision only makes reference to sustainable economies in a direct way.

17.2 Gender

The Commission on Gender Equality and the Gender Secretariat was established as one of the "six state institutions supporting constitutional democracy" called for in the 1996 Constitution. The aim of the Commission is to promote gender equality and to advise and make recommendations to Parliament or any other legislature on any laws or proposed legislation which affect gender equality and the status of women.

Little research has been done on gender issues in South Africa. However, gender equality, women's participation and gender balance are high on the priority list of the government, institutions and non-governmental organisations (NGOs). Women are increasingly being included among the top echelons of decision-making in Government and woman made up 38% of ministers and deputy ministers in parliament in 1999.

Within the formal water management structures, policies are well placed to allow for equal participation and decision-making for men and women. The gender policy of the South African Department of Water Affairs & Forestry is built around the core principles of equality, sustainability and empowerment in order to ensure a gender balance in planning and development of the provision of basic services such as water supply and sanitation. During 1997, the Minister of the Department of Water Affairs & Forestry established a Gender Secretariat to look at issues surrounding women and present-day water-resource management. Subsequently a gender policy regarding water resource and sanitation development and management was approved.

Another important development was in terms of rural legislation, where women married under traditional law can now inherit. In the past a widow had no right to remain on the land she enjoyed during her marriage. The lot of these women in rural areas is steadily improving through legislation such as the Recognition of Customary Marriages Act, 1998, which provides for the equal status and capacity of spouses in customary marriages.

The plight of single women is also addressed in the housing gender programme and the adaptation of subsidy grants. According to the new grant scheme, single women with incomes below R800/month and with dependants qualify for a subsidy of R22 800 (thus R2 479 extra, which is the amount necessary to obtain a normal subsidy of R20 300).

Several institutions and committees on national, provincial and institutional level have been established in South Africa in the past

few years to address gender imbalances and inequalities, yet the mainstreaming of gender in South Africa is a long way behind the developed world. If one accepts that the concept of sustainable development relies on the equitable participation of women and men in development projects to ensure the sustainability of the development intervention and to improve the quality of life and the standard of living for both women and men, it is essential that these issues be addressed in the reconstruction and development of human settlements in South Africa.

On the other hand, the role of culture in terms of sustainability should not be underestimated. Local communities do not necessarily take note of the wording of international declarations and local values change slowly. Harmony in communities is frequently more important than the wishes of people living far away. In the end it seems that only time and realities will change the already changed roles and position of women in decision-making, so that they can become part of their own future. However, it remains an open question as to what level women want their decision-making powers to change.

17.3 Child-care legislation

In 1996 the Cabinet established the National Programme of Action (NPA) for children to serve as a mechanism for carrying out South Africa's commitment to the progressive realisation of children's rights.

South Africa is drafting new comprehensive child care legislation that is compatible with the South African Constitution, the UN Convention on the Rights of the Child and the African Charter on the Rights and Welfare of the Child. The increasing demand for larger numbers of orphanages and child-care programmes as a result of HIV/Aids has a serious impact in providing access to basic education. Child-care legislation will therefore need to address the right to education for HIV/Aids orphans.

17.4 The National Youth Commission Act (1996)

The National Youth Commission was established in June 1996 through the National Youth Commission Act (1996) as part of government's plan to develop a comprehensive strategy to address the problems and challenges facing young women and men in South Africa. Considerable progress has been made in the transformation of services for the youth (those aged between 14 and 35). South Africa has introduced a number of welfare initiatives in residential care and the youth criminal justice system. These programmes aim to provide appropriate residential care for youths as well as to prevent youths from moving deeper into the criminal justice system.

17.5 The White Paper on Integrated Disability Strategy (1997)

The White Paper on the Integrated Disability Strategy (INDS) was launched in November 1997. The INDS identifies strategies by which government departments are to address issues of the inclusion and integration of disabled people into mainstream society. Disability issues cut across the spectrum of societal development and hence are to be included in all government policies, programmes and planning.

18. Conclusion

The content of this review led in Chapter 6 to a discussion of policy tensions and gaps, and then followed on into a discussion of the capacity of government to implement policy. As with the review of pressures in Appendix B, the above policy review is an exercise that would need to be repeated at regular intervals as policy adapts to the external environment. This in turn sets up new pressures on human settlements, communities and the biophysical environment.

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